US EPA RECORDS CENTER REGION 5



## RCRA FACILITY INVESTIGATION PHASE I REPORT

**VOLUME 4** 

ANALYTICAL LABORATORY RESULTS MAY 1998 RESAMPLING EVENT

### Prepared for:

Minnesota Mining and Manufacturing (3M) Cordova, Illinois

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July 1998

optimizing environmental resources - water, air, earth

## **CORDOVA RFI**

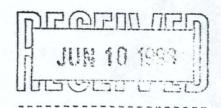
MAY 1998 ANALYTICAL REPORT

LOT#: A8E070148



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## ANALYTICAL REPORT

CORDOVA RFI MAY 1998

Lot #: A8E070148

Carol Snyder

3M Company

QUANTERRA INCORPORATED

Jeffrey C. Smith R. Fish Project Manager

May 20, 1998

## CASE NARRATIVE

The following report contains the analytical results for six water samples submitted to Quanterra-North Canton by 3M Company from the Cordova RFI May 1998 Site. The samples were received May 7, 1998 according to documented sample acceptance procedures.

Quanterra-North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided by facsimile transmission to Carol Snyder on May 14 and 15, 1998, and to Meg Clark on May 15, 1998.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Sample submitted for normal turn around time are reported under a separate cover.

The samples were received at the laboratory at temperatures of 0.5, 0.6, 0.4, and 1.5° C.

## SUPPLEMENTAL QC INFORMATION

### GENERAL CHEMISTRY

Matrix spike/matrix spike duplicate recoveries were outside the acceptance limits for Cyanide on batches 8128185 and 8131254. However, the acceptable laboratory control sample analysis data indicated that the analytical system was operating within control and this condition is most likely due to matrix interference.

## ANALYTICAL METHODS SUMMARY

#### A8E070148

PARAMETER	ANALYTICAL METHOD		
Amenable Cyanide Inductively Coupled Plasma (ICP) Metals Mercury in Liquid Waste (Manual Cold-Vapor) Organochlorine Pesticides PCBs Semivolatile Organic Compounds by GC/MS Total Cyanide Total Cyanide	SW846 9012 SW846 6010B SW846 7470A SW846 8081A SW846 8082 SW846 8270C SW846 9012 SW846 9012A SW846 6010B		
Trace Inductively Coupled Plasma (ICP) Metals Volatile Organics by GC/MS	SW846 8260B		

#### References:

SW846

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

## SAMPLE SUMMARY

### A8E070148

WO # SAMPLE# CLIENT SAMPLE ID	DATE TIME
CH0XM 001 RFI-I (RES) MW9-90 (MS/MSD 2)  CH108 002 RFI-I (RES) MW4-94  CH10A 003 FIELD DUPLICATE #2  CH10G 004 RFI-I (RES) MW7-90  CH10H 005 FIELD DUPLICATE #3  CH2EW 006 FIELD BLANK #3	05/06/98 10:22 05/06/98 11:57 05/06/98 11:57 05/06/98 14:07 05/06/98 14:07 05/06/98 16:04

### NOTE (S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor,
   paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

## Client Sample ID: RFI-I (RES) MW9-90 (MS/MSD 2)

## General Chemistry

Lot-Sample #...: A8E070148-001 Work Order #...: CHOXM Matrix....: WATER Date Sampled...: 05/06/98 10:22 Date Received..: 05/07/98

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND Diluti	5.0 on Factor: 1	ug/L	SW846 9012	05/12-05/13/98	8132160
Total Cyanide	ND Diluti	5.0 on Factor: 1	ug/L	SW846 9012	05/08-05/09/98	8128185

Client Sample ID: RFI-I (RES) MW4-94

### General Chemistry

Lot-Sample #...: A8E070148-002 Work Order #...: CH108 Matrix....: WATER Date Sampled...: 05/06/98 11:57 Date Received..: 05/07/98

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND	5.0	ug/L	SW846 9012	05/08-05/09/98	8128185
	Diluti	on Factor:	1			
Total Cyanide	ND	5.0	ug/L	SW846 9012	05/08-05/09/98	8128185
	Diluti	on Factor:	1			

## Client Sample ID: FIELD DUPLICATE #2

## General Chemistry

Lot-Sample #...: A8E070148-003 Work Order #...: CH10A Matrix....: WATER Date Sampled...: 05/06/98 11:57 Date Received..: 05/07/98

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND Diluti	5.0 on Factor:	ug/L	SW846 9012	05/12-05/13/98	8132160
Total Cyanide	ND Diluti	5.0 on Factor:	ug/L 1	SW846 9012	05/08-05/09/98	8128144

### 3H COMPANY

## Client Sample ID: RFI-I (RES) MW7-90

## General Chemistry

Lot-Sample #...: A8E070148-004 Work Order #...: CH10G Matrix....: WATER Date Sampled...: 05/06/98 14:07 Date Received..: 05/07/98

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND	5.0	ug/L	SW846 9012	05/08-05/09/98	8128185
Total Cyanide	ND	5.0 on Factor:	ug/L	SW846 9012	05/08-05/09/98	8128185

## Client Sample ID: FIELD DUPLICATE #3

### General Chemistry

Lot-Sample #...: A8E070148-005 Work Order #...: CH10H Matrix.....: WATER Date Sampled...: 05/06/98 14:07 Date Received..: 05/07/98

PARAMETER	RESULT	RL	UNITS	METHOD	ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND	5.0	ug/L	SW846 9012	05/08-05/09/98	8128185
Total Cyanide	ND	on Factor: 5.0 on Factor:	ug/L	SW846 9012	05/08-05/09/98	8128185

## Client Sample ID: FIELD BLANK #3

## General Chemistry

Lot-Sample #...: A8E070148-006 Work Order #...: CH2EW Matrix....: WATER Date Sampled...: 05/06/98 16:04 Date Received..: 05/07/98

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND Diluti	5.0 on Factor:	ug/L	SW846 9012	05/12-05/13/98	8132204
Total Cyanide	ND Diluti	5.0 on Factor:	ug/L	SW846 9012	05/11-05/14/98	8131254

QUALITY CONTROL SECTION

### QUALITY CONTROL ELEMENTS OF SW-846 METHODS

Quanterra® Incorporated conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

**OC BATCH** 

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. Quanterra requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. Failure to meet the established recovery guidelines requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). Failure of the RPDs to fall within the laboratory-generated acceptance windows requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the MS/MSD RPDs are within acceptance criteria, the batch is acceptable.

#### METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except for the common laboratory contaminants indicated below.

Volatile (GC or GC/MS)	Semivolatile (GC/MS)	Metals
Methylene chloride Acetone 2-Butanone	Phthalate Esters	Copper Iron Zinc
		Lead*

<sup>\*</sup> for analyses run on TJA Trace ICP or GFAA only

### **OUALITY CONTROL ELEMENTS OF SW-846 METHODS (continued)**

### METHOD BLANK (continued)

The listed volatile and semivolatile compounds may be present in concentrations up to 5 times the reporting limits. The listed metals may be present in concentrations up to 2 times the reporting limit or must be twenty fold less than the results of the environmental samples. Failure to meet these Method Blank criteria requires the repreparation and reanalysis of all samples in the QC batch.

### MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. When these values fail to meet acceptance criteria, the data is reviewed to determine the cause. If, in the analyst's judgment, sample matrix effects are indicated, no corrective action is performed. Otherwise, the MS/MSD and the environmental sample used to prepare them are reprepared and reanalyzed.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch.

### SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample are spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

The acceptance criteria do not apply to samples that are diluted. If the dilution is more than 5X, the recoveries will be reported as diluted out. All other surrogate recoveries will be reported. If the LCS, LCSD, or the Method Blank surrogates fail to meet recovery criteria (exception for dilutions), the entire batch of samples is reprepared and reanalyzed.

If the surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank and the associated sample(s) are ND, the batch is acceptable. If the surrogate recoveries are outside criteria for environmental or MS/MSD samples, the batch may be acceptable based on the analyst's judgment that sample matrix effects are indicated.

For the GC/MS BNA methods, the surrogate criteria is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide/PCB, PAH, TPH, and Herbicide methods, the surrogate criteria is that one of two surrogate compounds meet acceptance criteria.

### LABORATORY CONTROL SAMPLE EVALUATION REPORT

### General Chemistry

Client Lot #...: A8E010101 Matrix....: WATER

PARAMETER	PERCENT	RECOVERY LIMITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanid	e 100	Work Order (70 - 130) Dilution Factor: 1	#: CH1XH103 LCS SW846 9012	Lot-Sample#: A8E080000 05/08-05/09/98	-185 8128185
Amenable Cyanid	e 99	Work Order (70 - 130) Dilution Factor: 1	#: CH3V9102 LCS SW846 9012	S Lot-Sample#: A8E120000 05/12-05/13/98	-160 8132160
Amenable Cyanid	e 106		SW846 9012	05/12-05/13/98	8132204
Cyanide (Free)	81	Work Order (70 - 130) Dilution Factor: 1	SM18 4500-CN-I	S Lot-Sample#: A8E180000 05/18/98	-227 8138227
Total Cyanide	105		SW846 9012	S Lot-Sample#: A8E080000 05/08-05/09/98	-144 8128144
Total Cyanide	100		SW846 9012	S Lot-Sample#: A8E080000 05/08-05/09/98	-185 8128185
Total Cyanide	99		SW846 9012	S Lot-Sample#: A8E110000 05/11-05/14/98	-254 8131254

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

### METHOD BLANK REPORT

### General Chemistry

Client Lot #...: A8E070148

Matrix....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD		PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND	York Order 5.0 ion Factor: 1	#: CH1XH101 ug/L	MB Lot-Sample SW846 9012	#:	A8E080000-185 05/08-05/09/98	8128185
Amenable Cyanide	ND		#: CH3V9101 ug/L	MB Lot-Sample SW846 9012		A8E120000-160 05/12-05/13/98	8132160
Amenable Cyanide	ND		#: CH44N101 ug/L	MB Lot-Sample SW846 9012	#:	A8E120000-204 05/12-05/13/98	8132204
Total Cyanide	ND		#: CH1M5101 ug/L	MB Lot-Sample SW846 9012		A8E080000-144 05/08-05/09/98	8128144
Total Cyanide	ND		#: CH1XH101 ug/L	MB Lot-Sample SW846 9012		A8E080000-185 05/08-05/09/98	8128185
1 Cyanide	ND		#: CH3D4101 ug/L	MB Lot-Sample SW846 9012		A8E110000-254 05/11-05/14/98	8131254

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

### MATRIX SPIKE SAMPLE EVALUATION REPORT

### General Chemistry

Client Lot #...: A8E070148

Date Sampled...: 04/30/98 Date Received..: 05/02/98

PERCENT	RECOVERY	RPD LIMITS METHOD	PREPARATION- PREP ANALYSIS DATE BATCH #
		CGRAG11C-MS/CGRAG11D-MSD	MS Lot-Sample #: A8D290160-004
Total Cyanide			05/08-05/09/98 8128144
		SW846 9012	05/08-05/09/98 8128144
84		2.6 (0-20) SW846 9012	03/08-03/03/30 8120144
	Dilution Fac	ctor: 1	
	*****	gamani ar wa (aamani a wan	MS Lot-Sample #: A8E010101-002
Total Cyanide		CGTGQ10X-MS/CGTGQ110-MSD	05/08-05/09/98 8128185
	(70 - 130)	. SW846 9012	
0.0 N		0.0 (0-20) SW846 9012	05/08-05/09/98 8128185
	Dilution Fac	ctor: 1	
Total Cyanide	WO#:	CGTGQ12E-MS/CGTGQ12F-MSD	MS Lot-Sample #: A8E010101-002
		SW846 9012	05/11-05/14/98 8131254
5.9 N		18 (0-20) SW846 9012	
3.5	Dilution Fa		
Total Cyanide	WO#:	CHOXM105-MS/CHOXM106-MSD	MS Lot-Sample #: A8E070148-001
92		SW846 9012	05/08-05/09/98 8128185
88		3.4 (0-20) SW846 9012	05/08-05/09/98 8128185
	Dilution Fa		
			O C CONTRACTOR OF THE CONTRACT
Total Cyanide	WO#:	CHOXM107-MS/CHOXM108-MSD	
	(70 - 130)	SW846 9012	05/12-05/13/98 8132160
95		5.6 (0-20) SW846 9012	05/12-05/13/98 8132160
	Dilution Fa		

### NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

N Spiked analyte recovery is outside stated control limits.

results for ms/msd confirmed.

#### MATRIX SPIKE SAMPLE EVALUATION REPORT

#### General Chemistry

Client Lot #...: A8E110109 Matrix.....: WATER

Date Sampled...: 05/08/98 16:10 Date Received..: 05/09/98

PERCENT RECOVERY RPD PREPARATION- PREP

PARAMETER RECOVERY LIMITS RPD LIMITS METHOD ANALYSIS DATE BATCH #

Total Cyanide WO#: CH36K10A-MS/CH36K10C-MSD MS Lot-Sample #: A8E110109-001

NC,MSB (70 - 130) MCAWW 335.2 05/12-05/13/98 8132204

NC,MSB (70 - 130) (0-20) MCAWW 335.2 05/12-05/13/98 8132204

Dilution Factor: 1

#### NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

NC The recovery and RPD were not calculated.

MSB The recovery and RPD were not calculated because the sample amount was greater than four times the spike amount.

## Chain o ustody Record



OUA-4149-1			Project Manager				la.				
3M Company				Hunte				May 4, 1998	Page		
935 Bush Avz.			/ -	778 - 5			La	North Canton, OH	1 6		/sls
City St. Paul State	Zip Code 55144	-1000	Sile Ceptact	SNY	1			The second second	1 3		
Project Number/Name  Cordeva RFI May 19  Contract/Purchase Order/Quote Number	198		Carrier/Waybill Nu	mber		40	25 1	138	TO SO PO		
Sample I.D. Number and Description	Date	Time	Sample Type	Cor	ntainers Type	No.	Preservative	Condition on Receipt/Comments	THE STATE OF THE S		
PFI - I (RES) MU9-90	5/4/91	10:22	DATEL	1 Liter	Anhar	2	None		X		++++
Ţ,,		1		Zsoml	PUETIC	1	Naott	Rush (results w/i 6 days)	X		
RFI-I (150) MU9-90 (MS/MD *2)	5/4/91	10:72		1 Liter 250 ml	Putne	2	None		X		
DFI-I (R\$5) MU4-94	5/498	11:00		ILity	Anter	2	MONE		X .		
-1-1-1-1-	<del></del>	+		ZSom	PLANTIC	1	NaoH	Rush (rew Ha Hi Lodays)	X		
Field Deliute #2	5/4/41	11:57		1 Liter	Ash	7	Nope	Rush (results w/ Codage)	X	++++	
RFI-I (26) MU7-90	5/4/98	14107		1 Litea	Anhar	2	NONE		X ,		
-11-541-1 to	-1.1	4		250	Planic	-1	NaOH	12ush (rochable ledage)	, X		
Field Deplace #3	5/4/91	1.4;01	-	1 Liter	Arker	2	Nant	Rush (results wie Goday)	V		HHH
RFI - I (RIS) MH4-90	5/498	15:40		1 Life	PUSTIC	1	NONE	KOST LESOLE HIE COGA	Y		+++
KP+-4 (KIS) MIH-10	5/4/91	13,40		250ml	PLASTIC	1	Na OH	thold	Y		
Field Blank #3	5/4/94	16:04		Liter	Anker	2	JAGH	1814	X		
L DINCE	J.	4	4	250ml	PLANTE	1	NaOH	/	X		
	3/4/99 -551-2	174 174	Or CAro	1 500	der H/	Q	NONE	TEMP. Bt 3.5°C upon thipmin	t		
	in Irritant	Poison B			To Client	XD	isposal By Lab	Archive For Months	(A fee ma retained	ay be assessed if a longer than 3 mon	samples are ths)
Tum Around Time Required  Normal Rush Ott	her		OC Level As		Project S	Specific	: Requirements (	Specify)			
1. Relinquished By			S/4/98	17:23	1. Receive	ed By				Date	Time
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						(	Dos ?			5-7-98	1000
Comments Custody SENS OF	42671	t 0	+2646					S. C.			

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

# Chain of stody Record

S--15: 042656 + 042691

W.	HEHH		 611
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Contract/Purchase Order/Quote Number	,								V	10			1.5					
102801 / 10100									-	1	0	10	1					
	Data	Time	Sample Type		ntainers	-	Preservative	Condition on Receipt/Comments	SY	10	12	6	-					
Sample I.D. Number and Description	Date	Time		Volume	Туре	No.			+	+	H	+	V	+	+	+	+	+
Temperature Blank 55-5/6	5-6-98	-	Woter	40 ~1	Plastic	L	None		+	+	V	-	1	+	+	+	+	+
RFI-1(RES)55-5		0900	5011	120 ml	Glass	3	None		+	V	1	Š.	++	+	+	+	+	+
RFZ-1 (RES) 55-12		0930				1			-	10	1		++	+	+	+	+	+
RFZ-7 (RES) 55-16		1030	*	4	V	*	1		-	X	1	X	+	+	+	+	+	+
Field Blank 9		1050	water	1 Piter	Plastic	1	HNO,		+	1×	1	1	+	+	+	+	+	+
11 11		I	+	+	61985	2	None	455	-	+	X	X	H	-	+	+	+	+
RFI-1 (RES) SS-13		1145	50:1	120 ml	6/055	3	None	.79.	+	X	1	X	+	+	+	+	+	+
RFI-1 (RES) 55-14		1245						4:	-	X	$\square$	X	+	+	+	+	+	+
RF1-1 (RES) 55-17		1345							-	X	$\coprod$	X	+	+	H	+	1	+
RFI-1 (RES) 55-18		1430								X		X	+	+	11	+	H	+
RFI-1 (RES) 55-3	1	1520	1	1	V	V	1			1	X	X	1	1	11	-	1	+
KLT-1 (452) 73-2			-							1	Ш	1		1	$\perp$	-	1	+
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Call Cathy Larson	6/2-	221	6171	Sample Disp	osal	_	/-		- 11	$\Delta$ fo	op ma	av he	A ASS	PSSA	d if st	ample	es ar	е
Possible Hazard Identification		7		Potum	n To Client	X,	Dienocal Rv I ab	Archive For Mont	hs r	etai	ned	long	er tha	an 3 i	nonti	15)		
	in Irritant	Poison	B Unkn	e Work P	- Project	Specifi	ic Reauirements	(Specify)										
Turn Around Time Required				II. III.	5	40	> M - /	ordoug-RFI Wa	1,1	K	DI	74						
LL Holling.	ther		Date	II. III.	1. Recei	red By	2	7,0004			-	Date	,			Time	,	
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011					,	-	soro!	20				٠.٠	. 7	-7	-	-	, 0	_
Exception: Water	Vin Pla	stic	18 0	4 < 2	THNG	Pre	-servati	ve Trap Bla	n h	1	9	+	2	.1	2			
DISTRIBUTION; WHITE - Stays with the Sample; Ca	ANARY - Return	ed to Clier	nt with Report; PII					prior to	2	14	P	n. 1	· n '	4	~	16	10	2

## **CORDOVA RFI**

## MAY 1998 ANALYTICAL REPORT

LOT #: A8E060157



Quanterra Incorporated 4101 Shuffel Drive, NW North Canton, Ohio 44720

216 497-9396 Telephone 216 497-0772 Fax

## ANALYTICAL REPORT

CORDOVA RFI MAY 1998

Lot #: A8E060157

Carol Snyder

3M Company

QUANTERRA INCORPORATED

June 15, 1998

Jeffrey C.) Smith Project Manager

### CASE NARRATIVE

The following report contains the analytical results for fifteen water samples and thirteen solid samples submitted to Quanterra-North Canton by 3M Company from the Cordova RFI May 1998 Site. The samples were received May 6, 1998 according to documented sample acceptance procedures.

Quanterra-North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided by facsimile transmission to Carol Snyder on June 2 and 5, 1998.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

The coolers were received at the laboratory at temperatures of 1.2, 0.6, 1.1, 0.5, 0.5 and 0.2° C.

### SUPPLEMENTAL QC INFORMATION

#### SAMPLE RECEIVING

Three 40ml volatile vials for sample Trip blank were received with headspace.

The analysis was not marked on the chain-of-custody for sample Field Duplicate #1. The sample was logged for method 8081A per the Work Plan.

#### GC/MS VOLATILES

The matrix spike/matrix spike duplicate associated with batch 8134287 failed surrogate recovery criteria. The laboratory control sample associated with this batch was in control. This is believed to be a matrix effect; therefore, no further corrective action was taken.

### GC SEMIVOLATILES - Organochlorine Pesticides

The matrix spike/matrix spike duplicate associated with sample RFI-I (RES) MW5-90 (MS/MSD 1) on batch 8128110 exhibited recoveries and RPD outside the acceptable QC limits. The laboratory control sample was recovered at acceptable or slightly high levels indicating that the analytical system was operating with in control and this condition is most likely due to matrix interference.

Samples RFI-I (RES) SS-7 (MS/MSD 7) were diluted due to matrix effects and was ND; therefore, the detection limites were elevated.

## CASE NARRATIVE (continued)

### GC SEMIVOLATILES - Polychlorinatd Biphenyls

Matrix spike recovery data cannot be used to determine the analytical precision or accuracy due to the complex nature of the sample matrix. Samples were diluted out due to matrix interferences.

Samples RFI-I (RES) SS-20 (MS/MSD 6), RFI-I (RES) SS-21, RFI-I (RES) SS-22, and Field Duplicate were diluted due to matrix effects and was ND; therefore, the detection limites were elevated.

#### **METALS**

Matrix spike/spike duplicate spike recoveries were outside the acceptance limits for some analytes. The acceptable laboratory control sample analysis data indicated that the analytical system was operating within control and this condition is most likely due to matrix interference. See the Matrix Spike Report for the affected analytes which will be flagged with "N".

Matrix spike/spike duplicate relative percent difference (RPD) exceeded the acceptance limits for some analytes. The imprecision may be attributed to sample heterogeneity. See the Matrix Spike Report for the affected analytes which will be flagged with "\*".

## SAMPLE SUMMARY

#### A8E060157

WO # S	AMPLE#	CLIENT SAMPLE ID	DATE	TIME
WO # _	Part Don		05/04/98	13.04
CGXX2	001	FIELD BLANK 1	05/04/98	
CGXX4	002	EQUIPMENT BLANK 1	05/04/98	
CGXX9	003	RFI-I (RES) MW5-90 (MS/MSD 1)	05/05/98	
CGXXC	004	RFI-I (RES) MW6-90	05/05/98	
CGXXE	005	RFI-I (RES) MW1-94	05/05/98	
CGXXF	006	RFI-I (RES) MW2-94	05/05/98	
CGXXG	007	RFI-I (RES) MW7-94	05/05/98	
CGXXJ	008	EQUIPMENT BLANK #2	05/05/98	
CGXXK	009	FIELD BLANK #2	05/04/98	
CGXXL	010	FIELD DUPLICATE #1	05/04/98	
CGXXN	011	TRIP BLANK	05/05/98	
CGXXT	012	FIELD BLANK 7	05/05/98	
CH000	013	EQUIPMENT BLANK 4	05/05/98	
CH003	014	RFI-1 (RES) SS-25	05/05/98	
CH009	015	RFI-1 (RES) SS-26	05/05/98	
CHOOC	016	RFI-1 (RES) SS-27	05/05/98	
CHOOE	017	FIELD BLANK 8	05/05/98	
CHOOG	018	RFI-1 (RES) SS-20 (MS/MSD 6)	05/05/98	
CHOOK	019	RFI-1 (RES) SS-7 (MS/MSD 7)	05/05/98	
000	020	RFI-1 (RES) SS-21	05/04/98	
WOOH	021	FIELD BLANK 6	05/04/98	
CHOOX	022	RFI-I (RES) SS-1 (MS/MSD 4)	05/04/9	
CH015	023	RFI-I (RES) SS-28	05/04/9	
CH016	024	RFI-I (RES) SS-22	05/04/9	
CH01A	025	RFI-I (RES) SS-23		
CH01G	026	FIELD DUPLICATE 5	05/04/9	
CHOIL	027	FIELD DUPLICATE 6	05/04/9	
CH02L	028	RFI-1 (RES) SS-24 (MS/MSD5)	05/04/9	8 19:20

### NOTE (S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

## ANALYTICAL METHODS SUMMARY

#### A8E060157

PARAMETER	ANALYTICAL METHOD
Amenable Cyanide Inductively Coupled Plasma (ICP) Metals Organochlorine Pesticides PCBs Total Cyanide	SW846 9012 SW846 6010A SW846 8081A SW846 8082 SW846 9012
Total Residue as Percent Solids Trace Inductively Coupled Plasma (ICP) Metals Volatile Organics by GC/MS	MCAWW 160.3 MOD SW846 6010A SW846 8260A

#### References:

MCAWW	"Methods for Chemical Analysis of Water and Wastes",	
	EPA-600/4-79-020, March 1983 and subsequent revisions.	

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

## Client Sample ID: FIKID BLANK 1

### GC Semivolatiles

Lot-Sample #: A8E060157-001 Date Sampled: 05/04/98 13:04 Prep Date: 05/08/98	Work Order #: Date Received: Analysis Date:	05/06/98	Matrix: WATER
Prep Batch #: 8128110 Dilution Factor: 1	Method:	SW846 8081A	
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 0.050	UNITS ug/L
SURROGATE Tetrachloro-m-xylene Decachlorobiphenyl	PERCENT RECOVERY 56 80	RECOVERY LIMITS (10 - 130) (10 - 116)	

## Client Sample ID: EQUIPMENT BLANK 1

### GC/MS Volatiles

Lot-Sample #...: A8E060157-002 Work Order #...: CGXX4104 Matrix....: WATER

Date Sampled...: 05/04/98 16:02 Date Received..: 05/06/98
Prep Date....: 05/14/98 Analysis Date..: 05/14/98

Prep Batch #...: 8134287

Dilution Factor: 1 Method....: SW846 8260A

		REPORTI	NG
PARAMETER	RESULT	LIMIT	UNITS
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrolein	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Allyl chloride	ND	2.0	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	· ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
2-Butanone (MEK)	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
loroethane	ND	2.0	ug/L
hloroform	0.71	0.25	ug/L
Chloromethane	ND	2.0	ug/L
	ND	1.0	ug/L
Chloroprene Dibromochloromethane	ND	1.0	ug/L
1,2-Dibromo-3-chloro-	ND	2.0	ug/L
	112		
propane 1,2-Dibromoethane (EDB)	ND	1.0	ug/L
	ND	1.0	ug/L
Dibromomethane	ND	5.0	ug/L
trans-1,4-Dichloro-	ND		
2-butene	ND	2.0	ug/L
Dichlorodifluoromethane	ND .	1.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene		0.50	ug/L
trans-1,2-Dichloroethene	ND	1.0	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Ethylbenzene	ND .		ug/L
Ethyl methacrylate	ND	1.0	ug/L
2-Hexanone	ND	10	ug/L
Iodomethane	ND	1.0	
Isobutyl alcohol	ND	40	ug/L
Methacrylonitrile	ND	10	ug/L
Methylene chloride	ND	1.0	ug/L

(Continued on next page)

## Client Sample ID: EQUIPMENT BLANK 1

### GC/MS Volatiles

Lot-Sample #: A8E060157-002	Work Order #: CGXX4104	Matrix WATER
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		REPORTING	
PARAMETER	RESULT	LIMIT	UNITS
Methyl methacrylate	ND	1.0	ug/L
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L
Propionitrile	ND	4.0	ug/L
Styrene	ND .	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Trichlorofluoromethane	ND	2.0	ug/L
1,2,3-Trichloropropane	ND	1.0	ug/L
Vinyl acetate	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Xylenes (total)	ND	1.0	ug/L
Dichlorobenzene	ND	1.0	ug/L
Dichlorobenzene	ND	1.0	ug/L
o-Dichlorobenzene	ND	1.0	ug/L
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	_1
1,2-Dichloroethane-d4	93	(69 - 127	)
Toluene-d8	96	(90 - 112	:)
Bromofluorobenzene	94	(87 - 114	1)

## Client Sample ID: EQUIPMENT BLANK 1

### GC Semivolatiles

Lot-Sample #: A8E060157-002 Date Sampled: 05/04/98 16:02 Prep Date: 05/08/98 Prep Batch #: 8128110	Date Received: Analysis Date:	05/06/98 05/28/98	Matrix: WATER
Dilution Factor: 1	Method:	SW846 8081A	
PARAMETER	RESULT		UNITS
Hexachlorobenzene	ND	0.050	ug/L
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	
Tetrachloro-m-xylene	60	(10 - 130)	

Decachlorobiphenyl

(10 - 116)

## Client Sample ID: EQUIPMENT BLANK 1

### General Chemistry

Lot-Sample #...: A8E060157-002 Work Order #...: CGXX4
Date Sampled...: 05/04/98 16:02 Date Received..: 05/06/98

Matrix..... WATER

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- PREP ANALYSIS DATE BATCH #	-
Amenable Cyanide	ND V	10	ug/L	SW846 9012	05/15-05/18/98 8135242	
Total Cyanide	Diluti 22	on Factor: 10	ug/L	SW846 9012	05/15-05/18/98 8135242	:
	Diluti	on Factor:	2			

NOTE (S):

RL Reporting Limit

V Elevated reporting limit. The reporting limit is elevated due to limited sample volume.

## Client Sample ID: RFI-I (RES) MW5-90 (MS/MSD 1)

### GC Semivolatiles

Lot-Sample #: A8E060157-003 Date Sampled: 05/04/98 18:39 Prep Date: 05/08/98	Work Order #: Date Received: Analysis Date:	05/06/98	Matrix: WATER	2
Prep Batch #: 8128110 Dilution Factor: 1	Method:	SW846 8081	Α .	
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 0.050	UNITS ug/L	
SURROGATE Tetrachloro-m-xylene	PERCENT RECOVERY	RECOVERY LIMITS (10 - 130)		

(10 - 116)

62

Tetrachloro-m-xylene

Decachlorobiphenyl

## Client Sample ID: RFI-I (RES) MW6-90

#### GC Semivolatiles

Lot-Sample #:	A8E060157-004	Work Order #:	CGXXC101	Matrix WATER
Date Sampled:	05/05/98 09:17	Date Received:	05/06/98	
Prep Date:		Analysis Date:	05/28/98	

Prep Date....: 05/08/98 Prep Batch #...: 8128110

Dilution Factor: 1 Method.....: SW846 8081A

		REPORTING		
PARAMETER	RESULT	LIMIT	UNITS	
Hexachlorobenzene	ND	0.050	ug/L	

 SURROGATE
 RECOVERY
 LIMITS

 Tetrachloro-m-xylene
 58
 (10 - 130)

 Decachlorobiphenyl
 73
 (10 - 116)

## Client Sample ID: RFI-I (RES) MW1-94

### GC Semivolatiles

Lot-Sample #: A8E060157-005 Date Sampled: 05/05/98 12:14 Prep Date: 05/08/98 Prep Batch #: 8128110 Dilution Factor: 1	Work Order #: Date Received: Analysis Date: Method	05/06/98 05/28/98	Matrix: WATER
PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND PERCENT	0.050 RECOVERY LIMITS	ug/L
SURROGATE	RECOVERY		•
Tetrachloro-m-xylene	52	(10 - 130)	

(10 - 116)

66

Decachlorobiphenyl

## Client Sample ID: RFI-I (RES) MW2-94

### GC Semivolatiles

Lot-Sample #: A8E060157-006 Date Sampled: 05/05/98 13:56 Prep Date: 05/08/98	Work Order #: Date Received: Analysis Date:	05/06/98	Matrix: W	ATER
Prep Batch #: 8128110 Dilution Factor: 1	Method:	SW846 8081	A	
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 0.050	UNITS ug/L	
SURROGATE Tetrachloro-m-xylene	PERCENT RECOVERY 58	RECOVERY LIMITS (10 - 130)		

Decachlorobiphenyl

(10 - 116)

## Client Sample ID: RFI-I (RES) MW7-94

## GC Semivolatiles

Lot-Sample #: A8E060157-007 Date Sampled: 05/05/98 14:55 Prep Date: 05/08/98 Prep Batch #: 8128110 Dilution Factor: 1	Work Order #: Date Received: Analysis Date: Method:	05/06/98 05/28/98	Matrix: WATER
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 0.050	UNITS ug/L
SURROGATE Tetrachloro-m-xylene	PERCENT RECOVERY 54	RECOVERY LIMITS (10 - 130)	

(10 - 116)

67

Decachlorobiphenyl

Client Sample ID: EQUIPMENT BLANK #2

#### GC Semivolatiles

"	3050C01E7 000	Work Order #	- CGXXJ102	Matrix V	NATER
Tot-Cample #	A8E060157-008	WOLK OLDER #**	- CGAAUIU2		

Date Sampled...: 05/05/98 15:26 Date Received..: 05/06/98 Prep Date....: 05/08/98 Analysis Date..: 05/28/98

Prep Batch #...: 8128110

Dilution Factor: 1 Method.....: SW846 8081A

REPORTING

PARAMETER RESULT LIMIT UNITS
Hexachlorobenzene ND 0.050 ug/L

PERCENT RECOVERY

SURROGATE RECOVERY

Tetrachloro-m-xylene 55 (10 - 130)

 Tetrachloro-m-xylene
 55
 (10 - 130)

 Decachlorobiphenyl
 76
 (10 - 116)

# Client Sample ID: FIKLD BLANK #2

## GC Semivolatiles

Lot-Sample #: A8E060157-009 Date Sampled: 05/05/98 15:50 Prep Date: 05/08/98	Work Order #: Date Received: Analysis Date:	05/06/98	Matrix WATER
Prep Batch #: 8128110 Dilution Factor: 1	Method:	SW846 8081A	
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 0.050	UNITS ug/L
SURROGATE Tetrachloro-m-xylene Decachlorobiphenyl	PERCENT RECOVERY 52 67	RECOVERY LIMITS (10 - 130) (10 - 116)	

## Client Sample ID: FIELD DUPLICATE #1

## GC Semivolatiles

Lot-Sample #: A8E060157-010 Date Sampled: 05/04/98 18:39 Prep Date: 05/08/98	Work Order #: Date Received: Analysis Date:	05/06/98	Matrix:	WATER
Prep Batch #: 8128110 Dilution Factor: 1	Method:	SW846 80812	4	
PARAMETER	RESULT	REPORTING LIMIT 0.050	UNITS ug/L	
Hexachlorobenzene	ND	- 12-79	-3/ -	
SURROGATE	PERCENT	LIMITS (10 - 130)		
Tetrachloro-m-xylene	55	(10 - 130)		

(10 - 116)

70

Decachlorobiphenyl

## Client Sample ID: TRIP BLANK

## GC/MS Volatiles

Lot-Sample #...: A8E060157-011 Work Order #...: CGXXN101 Matrix....: WATER

Date Sampled...: 05/04/98

Prep Date....: 05/12/98

Date Received..: 05/06/98

Analysis Date..: 05/12/98

Prep Batch #...: 8133164

Dilution Factor: 1 Method.....: SW846 8260A

		REPORTIN	IG	
PARAMETER	RESULT	LIMIT	UNITS	
Acetone	ND	10	ug/L	
Acetonitrile	ND	20	ug/L	
Acrolein	ND	20	ug/L	
Acrylonitrile	ND	20	ug/L	
Allyl chloride	ND	2.0	ug/L	
Benzene	ND	1.0	ug/L	
Bromodichloromethane	ND	1.0	ug/L	
Bromoform	ND	1.0	ug/L	
Bromomethane	ND	2.0	ug/L	
2-Butanone (MEK)	ND	10	ug/L	
Carbon disulfide	ND	1.0	ug/L	
Carbon tetrachloride	ND	1.0	ug/L	
Chlorobenzene	ND	1.0	ug/L	
loroethane	ND	2.0	ug/L	
hloroform	ND	0.25	ug/L	
Chloromethane	ND	2.0	ug/L	
Chloroprene	ND	1.0	ug/L	
Dibromochloromethane	ND	1.0	ug/L	
1,2-Dibromo-3-chloro-	ND	2.0	ug/L	
•				
propane 1,2-Dibromoethane (EDB)	ND	1.0	ug/L	
	ND	1.0	ug/L	
Dibromomethane	ND	5.0	ug/L	
trans-1,4-Dichloro-	ND			
2-butene	ND	2.0	ug/L	
Dichlorodifluoromethane	ND .	1.0	ug/L	4
1,1-Dichloroethane	ND	1.0	ug/L	
1,2-Dichloroethane		1.0	ug/L	
1,1-Dichloroethene	ND	0.50	ug/L	
trans-1,2-Dichloroethene	ND	1.0	ug/L	
1,2-Dichloropropane	ND	1.0	ug/L	
cis-1,3-Dichloropropene	ND	1.0	ug/L	
trans-1,3-Dichloropropene	ND		ug/L	
Ethylbenzene	ND	1.0	ug/L	
Ethyl methacrylate	ND	1.0	ug/L	
2-Hexanone	ND	10	The state of the s	
Iodomethane	ND	1.0	ug/L	
Isobutyl alcohol	ND	40	ug/L	
Methacrylonitrile	ND	10	ug/L	
Methylene chloride	ND	1.0	ug/L	

(Continued on next page)

# Client Sample ID: TRIP BLANK

## GC/MS Volatiles

Lot-Sample #: A8E060157-011 Work (	der #: CGXXN101	Matrix WATER
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		REPORTIN	īG	
PARAMETER	RESULT	LIMIT	UNITS	_
Methyl methacrylate	ND	1.0	ug/L	
4-Methyl-2-pentanone (MIBK)	ND	. 10	ug/L	
Propionitrile	ND	4.0	ug/L	
Styrene	ND	1.0	ug/L	
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	
Tetrachloroethene	ND	1.0	ug/L	
Toluene	ND	1.0	ug/L	
1,1,1-Trichloroethane	ND	1.0	ug/L	
1,1,2-Trichloroethane	ND	1.0	ug/L	
Trichloroethene	ND	1.0	ug/L	
Trichlorofluoromethane	ND	2.0	ug/L	
1,2,3-Trichloropropane	ND	1.0	ug/L	
Vinyl acetate	ND	2.0	ug/L	
Vinyl chloride	ND	2.0	ug/L	
Xylenes (total)	ND	1.0	ug/L	
-Dichlorobenzene	ND	1.0	ug/L	
-Dichlorobenzene	ND	1.0	ug/L	
o-Dichlorobenzene	ND	1.0	ug/L	
	PERCENT	RECOVER	Y	
SURROGATE	RECOVERY	LIMITS		
1,2-Dichloroethane-d4	80	(69 - 1		
Toluene-d8	103	(90 - 1		
Bromofluorobenzene	102	(87 - 1	.14)	

## Client Sample ID: FIELD BLANK 7

## GC Semivolatiles

Tot-Sample # : A	8E060157-012	Work Order #.	: CGXXT103	Matrix:	WATER

Date Sampled...: 05/05/98 08:45 Date Received..: 05/06/98 Prep Date....: 05/08/98 Analysis Date..: 05/27/98

Prep Batch #...: 8128113

Dilution Factor: 1 Method....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS	
Aroclor 1016	ND	1.0	ug/L	
Aroclor 1221	ND	1.0	ug/L	
Aroclor 1232	ND	1.0	ug/L	
Aroclor 1242	ND	1.0	ug/L	
Aroclor 1248	ND	1.0	ug/L	
Aroclor 1254	ND	1.0	ug/L	
Aroclor 1260	ND	1.0	ug/L	
	PERCENT	RECOVERY		
SURROGATE	RECOVERY	LIMITS	_	
Tetrachloro-m-xylene	79	(10 - 130)		
Decachlorobiphenyl	82	(10 - 116)		

# Client Sample ID: FIELD BLANK 7

## TOTAL Metals

Lot-Sample #...: A8E060157-012 Matrix....: WATER

Date Sampled...: 05/05/98 08:45 Date Received..: 05/06/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #. Arsenic	: 8132253 ND	5.0 Dilution Factor: 1	ug/L	SW846 6010A	05/13-05/18/98	CGXXT102
Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CGXXT101

## Client Sample ID: EQUIPMENT BLANK 4

## GC Semivolatiles

Lot-Sample #: A8E060157-013 Date Sampled: 05/05/98 09:00 Prep Date: 05/08/98 Prep Batch #: 8128110 Dilution Factor: 1	Work Order #: Date Received: Analysis Date: Method:	05/06/98 05/27/98	Matrix WATER
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 0.050	UNITS ug/L
SURROGATE Tetrachloro-m-xylene	PERCENT RECOVERY	RECOVERY LIMITS (10 - 130)	

74

Decachlorobiphenyl

(10 - 116)

## Client Sample ID: EQUIPMENT BLANK 4

## GC Semivolatiles

Tot-Cample #	A8E060157-013	Work	Order #:	CH000103	Matrix:	WATER

Date Sampled...: 05/05/98 09:00 Date Received..: 05/06/98
Prep Date....: 05/08/98
Analysis Date..: 05/27/98

Prep Batch #...: 8128113

Dilution Factor: 1 Method....: SW846 8082

PARAMETER	RESULT	LIMIT UNITS	
Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260	ND ND ND ND ND ND ND ND ND	1.0 ug/L	
SURROGATE Tetrachloro-m-xylene Decachlorobiphenyl	PERCENT RECOVERY 87 86	RECOVERY LIMITS (10 - 130) (10 - 116)	

## Client Sample ID: EQUIPMENT BLANK 4

## TOTAL Metals

Lot-Sample #...: A8E060157-013 Matrix....: WATER

Date Sampled...: 05/05/98 09:00 Date Received..: 05/06/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch # Arsenic	*: 8132253 ND	5.0 Dilution Factor: 1	ug/L	SW846 6010A	05/13-05/18/98	CH000102
Cobalt	ND	7.0 Dilution Factor: 1	ug/L	SW846 6010A	05/13-05/18/98	CH000101

## Client Sample ID: RFI-1 (RES) SS-25

## GC Semivolatiles

Lot-Sample #: A8E060157-014	Work Order #: CH003104	Matrix SOLID
-----------------------------	------------------------	--------------

Date Sampled...: 05/05/98 09:45 Date Received..: 05/06/98 Prep Date....: 05/13/98 Analysis Date..: 05/25/98

Prep Batch # ...: 8133101

Dilution Factor: 1

\* Moisture....: 6.3 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	35	ug/kg
Aroclor 1221	ND	35	ug/kg
Aroclor 1232	ND	35	ug/kg
Aroclor 1242	ND	35	ug/kg
Aroclor 1248	ND	35	ug/kg
Aroclor 1254	ND	35	ug/kg
Aroclor 1260	ND	35	ug/kg
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	<u></u>
Tetrachloro-m-xylene	94	(8.0- 12	9)
Decachlorobiphenyl	101	(0.0- 13	8)
Decacinoconspicing			

TR(S):

Client Sample ID: RFI-1 (RES) SS-25

## TOTAL Metals

Matrix....: SOLID Lot-Sample #...: A8E060157-014

Date Sampled...: 05/05/98 09:45 Date Received..: 05/06/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch # Arsenic	: 8135119 1200	1070 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH003102
Cobalt	ND	5340 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH003103

NOTE (S):

Client Sample ID: RFI-1 (RES) SS-25

## General Chemistry

Lot-Sample #...: A8E060157-014 Work Order #...: CH003

Matrix..... SOLID

MCAWW 160.3 MOD 05/07-05/08/98 8127137

Date Sampled...: 05/05/98 09:45 Date Received..: 05/06/98

\* Moisture....: 6.3

Percent Solids

PREPARATION-PREP ANALYSIS DATE BATCH # METHOD RESULT RL UNITS

> 93.7 Dilution Factor: 1

0.10

NOTE (S):

RL Reporting Limit

## Client Sample ID: RFI-1 (RES) SS-26

## GC Semivolatiles

Lot-Sample #: Date Sampled: Prep Date: Prep Batch #:	05/05/98 10:20 05/13/98	Work Order #: Date Received: Analysis Date:	05/06/98	Matrix: SOLID
Dilution Factor: % Moisture:		Method:	SW846 8082	
			REPORTING	
PARAMETER		RESULT	LIMIT	UNITS
Aroclor 1016		ND	36	ug/kg
Aroclor 1221		ND ·	36	ug/kg
Aroclor 1232		ND	36	ug/kg
Aroclor 1242		ND	36	ug/kg
Aroclor 1248		ND	36	ug/kg
Aroclor 1254		ND	36	ug/kg
Aroclor 1260		ND	36	ug/kg
		PERCENT	RECOVERY	

LIMITS

(8.0- 129)

(0.0 - 138)

RECOVERY

88

100

NOTE (S):

SURROGATE

Tetrachloro-m-xylene

Decachlorobiphenyl

Client Sample ID: RFI-1 (RES) SS-26

#### TOTAL Metals

Lot-Sample #...: A8E060157-015

Date Sampled...: 05/05/98 10:20 Date Received..: 05/06/98

\* Moisture....: 8.2

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch # Arsenic	: 8135119 1490	1090 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH009102
Cobalt	ND	5450 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH009103

Client Sample ID: RFI-1 (RES) SS-26

## General Chemistry

Lot-Sample #...: A8E060157-015 Work Order #...: CH009

Matrix..... SOLID

Date Sampled...: 05/05/98 10:20 Date Received..: 05/06/98

\* Moisture....: 8.2

PREPARATION-PREP

PARAMETER

RESULT 91.8

RL UNITS METHOD

ANALYSIS DATE BATCH #

Percent Solids

0.10

Dilution Factor: 1

MCAWW 160.3 MOD

05/07-05/08/98 8127137

NOTE (S):

RL Reporting Limit

## Client Sample ID: RFI-1 (RES) SS-27

#### GC Semivolatiles

Lot-Sample #: A8E060157-016	Work Order #: CH00C104	Matrix: SOLID
noc bump "		

Date Sampled...: 05/05/98 11:00 Date Received..: 05/06/98 Prep Date....: 05/13/98 Analysis Date..: 05/25/98

Prep Batch #...: 8133101

Dilution Factor: 1

\* Moisture....: 9.1 Method....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS	
Aroclor 1016	ND	36	ug/kg	
Aroclor 1221	ND	36	ug/kg	
Aroclor 1232	ND	36	ug/kg	
Aroclor 1242	ND	36	ug/kg	
Aroclor 1248	ND	36	ug/kg	
Aroclor 1254	ND	36	ug/kg	
Aroclor 1260	ND	36	ug/kg	
	PERCENT	RECOVERY	•	
SURROGATE	RECOVERY	LIMITS	_	
Tetrachloro-m-xylene	106	(8.0- 129		
Decachlorobiphenyl	111	(0.0- 138	)	

OTE(S):

## Client Sample ID: RFI-1 (RES) SS-27

#### TOTAL Metals

Lot-Sample #...: A8E060157-016 Matrix....: SOLID

Date Sampled...: 05/05/98 11:00 Date Received..: 05/06/98

\* Moisture....: 9.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch # Arsenic	: 8135119 1330	1100 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH00C102
Cobalt	7000	5500 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH00C103

NOTE (S):

Client Sample ID: RFI-1 (RES) SS-27

## General Chemistry

Lot-Sample #...: A8E060157-016 Work Order #...: CH00C Matrix.....: SOLID

Date Sampled...: 05/05/98 11:00 Date Received..: 05/06/98

% Moisture....: 9.1

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	90.9	0.10	*	MCAWW 160.3 MOD	05/07-05/08/98	8127139
	Diluti	on Factor: 1				

## NOTE (S):

RL Reporting Limit

## Client Sample ID: FIELD BLANK 8

## GC Semivolatiles

Lot-Sample #: A8E060157-017			Matrix WATER
Date Sampled: 05/05/98 13:40	Date Received:	05/06/98	
Prep Date: 05/08/98	Analysis Date:	05/28/98	
Prep Batch #: 8128110			
Dilution Factor: 1	Method:	SW846 8081	A
		REPORTING	
PARAMETER	RESULT	LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	
		120 2201	

(10 - 130)

(10 - 116)

52

76

Tetrachloro-m-xylene

Decachlorobiphenyl

# Client Sample ID: FIELD BLANK 8

## GC Semivolatiles

Tot-Sample #	- ASE060157-017	Work Order #: CH00E102	Matrix WATER

Date Sampled...: 05/05/98 13:40 Date Received..: 05/06/98 Analysis Date..: 05/27/98 Prep Date....: 05/08/98

Prep Batch #...: 8128113

Method....: SW846 8082 Dilution Factor: 1

PARAMETER Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248	RESULT ND ND ND ND ND ND ND ND	REPORTING LIMIT 1.0 1.0 1.0 1.0 1.0 1.0 1.0	UNITS ug/L ug/L ug/L ug/L ug/L ug/L	
Aroclor 1254 Aroclor 1260	ND	1.0	ug/L	
SURROGATE	PERCENT	RECOVERY LIMITS	_	
Tetrachloro-m-xylene Decachlorobiphenyl	84 94	(10 - 130) (10 - 116)		

## Client Sample ID: FIKLD BLANK 8

#### TOTAL Metals

Matrix....: WATER Lot-Sample #...: A8E060157-017

Date Sampled...: 05/05/98 13:40 Date Received..: 05/06/98

PREPARATION- WORK REPORTING ANALYSIS DATE ORDER # LIMIT UNITS METHOD PARAMETER RESULT

Prep Batch #...: 8132253 05/13-05/18/98 CH00E101 ug/L SW846 6010A 7.0 Cobalt

Dilution Factor: 1

## Client Sample ID: RFI-1 (RES) SS-20 (MS/MSD 6)

#### GC Semivolatiles

Lot-Sample #: A8E060157-018	Work Order #: CH00G103	Matrix SOLID
-----------------------------	------------------------	--------------

Date Sampled...: 05/05/98 13:55 Date Received..: 05/06/98 Prep Date....: 05/13/98 Analysis Date..: 06/02/98

Prep Batch # ...: 8133101

Dilution Factor: 20

\* Moisture....: 16 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS	
Aroclor 1016	ND	780	ug/kg	
Aroclor 1221	ND	780	ug/kg	
Aroclor 1232	ND	780	ug/kg	
Aroclor 1242	ND	780	ug/kg	
Aroclor 1248	ND	780	ug/kg	
Aroclor 1254	ND	780	ug/kg	
Aroclor 1260	ND	780	ug/kg	
	PERCENT	RECOVERY		
SURROGATE	RECOVERY	LIMITS	_	
Tetrachloro-m-xylene	210 DIL,*	(8.0- 129)	)	
Decachlorobiphenyl	349 DIL,*	(0.0- 138)	)	

#### OTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

Client Sample ID: RFI-1 (RES) SS-20 (MS/MSD 6)

#### TOTAL Metals

Lot-Sample #...: A8E060157-018

Matrix....: SOLID

Date Sampled...: 05/05/98 13:55 Date Received..: 05/06/98

\* Moisture....: 16

REPORTING

PREPARATION-

WORK

PARAMETER

RESULT

LIMIT UNITS

METHOD

ANALYSIS DATE ORDER #

Prep Batch #...: 8135119

53000

5920

ug/kg

SW846 6010A

05/15-05/18/98 CH00G102

Dilution Factor: 1

NOTE (S):

Cobalt

## Client Sample ID: RFI-1 (RES) SS-7 (MS/MSD 7)

#### GC Semivolatiles

Lot-Sample #: A8E060157-019	Work Order #: CH00K102	Matrix SOLID
-----------------------------	------------------------	--------------

Date Sampled...: 05/05/98 14:40 Date Received..: 05/06/98 Prep Date....: 05/12/98 Analysis Date..: 05/27/98

Prep Batch #...: 8132108

Dilution Factor: 1 % Moisture....: 13

Method....: SW846 8082

PARAMETER	RESULT	REPORTIN	UNITS UNITS	
Aroclor 1016	ND	38	ug/kg	
Aroclor 1221	ND	38	ug/kg	
Aroclor 1232	ND	38	ug/kg	
Aroclor 1242	ND	38	ug/kg	
Aroclor 1248	ND	38	ug/kg	
Aroclor 1254	ND ·	38	ug/kg	
Aroclor 1260	ND	38	ug/kg	
	PERCENT	RECOVERS		
SURROGATE	RECOVERY	LIMITS		
Tetrachloro-m-xylene	87	(8.0- 12	29)	
Decachlorobiphenyl	90	(0.0- 13	(8)	

OTE (S):

Client Sample ID: RFI-1 (RES) SS-20 (MS/MSD 6)

## General Chemistry

Lot-Sample #...: A8E060157-018 Work Order #...: CH00G Matrix....: SOLID

Date Sampled...: 05/05/98 13:55 Date Received..: 05/06/98

\* Moisture....: 16

PARAMETER RESULT RL UNITS METHOD ANALYSIS DATE BATCH #
Percent Solids 84.4 0.10 % MCAWW 160.3 MOD 05/07-05/08/98 8127139

Dilution Factor: 1

NOTE (S):

RL Reporting Limit

# Client Sample ID: RFI-1 (RES) SS-7 (MS/MSD 7)

## GC Semivolatiles

Date Received:	05/06/98	Matrix: SOLID
Method:	SW846 8081	
RESULT	REPORTING LIMIT	UNITS ug/kg
Torritory.	The second second	
RECOVERY 0.0 DIL,*	LIMITS (8.0- 129)	
	Date Received: Analysis Date: Method  RESULT ND  PERCENT RECOVERY	RESULT LIMIT ND 38  PERCENT RECOVERY RECOVERY LIMITS

231 DIL,\*

(0.0 - 138)

## NOTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Decachlorobiphenyl

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

Client Sample ID: RFI-1 (RES) SS-7 (MS/MSD 7)

## General Chemistry

Lot-Sample #...: A8E060157-019 Work Order #...: CH00K

Matrix....: SOLID

Date Sampled...: 05/05/98 14:40 Date Received..: 05/06/98

% Moisture....: 13

0.10

Dilution Factor: 1

PREPARATION-

PARAMETER

RESULT

UNITS

METHOD MCAWW 160.3 MOD

ANALYSIS DATE BATCH #

Percent Solids

RL 86.5

05/07-05/08/98 8127139

NOTE (S):

RL Reporting Limit

## Client Sample ID: RFI-1 (RES) SS-21

## GC Semivolatiles

Tat Cample # . 7	8E060157-020	Work Order	#: CH00Q103	Matrix	SOLID

Date Sampled...: 05/05/98 15:45 Date Received..: 05/06/98 Prep Date....: 05/13/98 Analysis Date..: 06/02/98

Prep Batch #...: 8133101

Dilution Factor: 20

% Moisture....: 11 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260	ND ND ND ND ND ND ND	740 740 740 740 740 740 740	ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg
SURROGATE Tetrachloro-m-xylene Decachlorobiphenyl	PERCENT RECOVERY 96 DIL 194 DIL,*	RECOVERY LIMITS (8.0- 129 (0.0- 138	

## NOTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

Client Sample ID: RFI-1 (RES) SS-21

#### TOTAL Metals

Matrix....: SOLID Lot-Sample #...: A8E060157-020

Date Sampled...: 05/05/98 15:45 Date Received..: 05/06/98

\* Moisture ....: 11

PREPARATION-WORK REPORTING

ANALYSIS DATE ORDER # LIMIT UNITS METHOD RESULT PARAMETER

Prep Batch # ...: 8135119

05/15-05/18/98 CH00Q102 SW846 6010A ug/kg 5600 50600 Cobalt

Dilution Factor: 1

NOTE (S):

## Client Sample ID: FIRLD BLANK 6

## GC Semivolatiles

Lot-Sample #: A8E060157-021 Date Sampled: 05/04/98 18:40 Prep Date: 05/08/98 Prep Batch #: 8128110	Work Order #: Date Received: Analysis Date:	05/06/98
Dilution Factor: 1	Method:	SW846 8081A
PARAMETER	RESULT ND	REPORTING LIMIT UNITS 0.050 ug/L
Hexachlorobenzene	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene Decachlorobiphenyl	52 75	(10 - 130) (10 - 116)

## Client Sample ID: FIKLD BLANK 6

## GC Semivolatiles

Lot-Sample #: A8E060157-021	Work Order #: CH00W103	Matrix: WATER
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Date Sampled...: 05/04/98 18:40 Date Received..: 05/06/98 Prep Date....: 05/08/98 Analysis Date..: 05/27/98

Prep Batch #...: 8128113

Dilution Factor: 1 Method....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	1.0	ug/L
Aroclor 1221	ND	1.0	ug/L
Aroclor 1232	ND	1.0	ug/L
Aroclor 1242	ND	1.0	ug/L
Aroclor 1248	ND	1.0	ug/L
Aroclor 1254	ND	1.0	ug/L
Aroclor 1260	ND	1.0	ug/L
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	<u></u>
Tetrachloro-m-xylene	86	(10 - 130	)
Decachlorobiphenyl	91	(10 - 116	)

## Client Sample ID: FIKID BLANK 6

#### TOTAL Metals

Matrix....: WATER Lot-Sample #...: A8E060157-021
Date Sampled...: 05/04/98 18:40 Date Received..: 05/06/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch # Arsenic	: 8132253 ND	5.0 Dilution Factor: 1	ug/L	SW846 6010A	05/13-05/18/98	CH00W102
Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CH00M101

# Client Sample ID: RFI-I (RES) SS-1 (MS/MSD 4)

## GC Semivolatiles

Lot-Sample #: A8E060157-022 Date Sampled: 05/04/98 15:55 Prep Date: 05/12/98 Prep Batch #: 8132107	Work Order #: Date Received: Analysis Date:	05/06/98	Matrix: SOLID
Dilution Factor: 1 % Moisture: 8.7	Method:	SW846 8081A	
PARAMETER Hexachlorobenzene	RESULT ND		UNITS ug/kg
SURROGATE Tetrachloro-m-xylene Decachlorobiphenyl	PERCENT RECOVERY 140 DIL,* 962 DIL,*	RECOVERY LIMITS (8.0- 129) (0.0- 138)	

## NOTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

# Client Sample ID: RFI-I (RES) SS-1 (MS/MSD 4)

## GC Semivolatiles

Tot-Sample #: A8E060157-022	Work Order #: CH00X102	Matrix Solid

Date Sampled...: 05/04/98 15:55 Date Received..: 05/06/98 Analysis Date..: 05/28/98 Prep Date....: 05/12/98

Prep Batch #...: 8132108

Dilution Factor: 1

Method..... SW846 8082 % Moisture....: 8.7

PARAMETER	RESULT	REPORTING LIMIT	UNITS ug/kg		
Aroclor 1016	ND	36			
Aroclor 1221	ND	36	ug/kg		
Aroclor 1232	ND	36	ug/kg		
Aroclor 1242	ND	36	ug/kg		
Aroclor 1248	ND	36	ug/kg		
Aroclor 1254	ND	36	ug/kg		
Aroclor 1260	ND	36	ug/kg		
	PERCENT	RECOVERY	3		
SURROGATE	RECOVERY	LIMITS	_		
Tetrachloro-m-xylene	64		(8.0- 129)		
Decachlorobiphenyl	51	(0.0- 138	3)		

# Client Sample ID: RFI-I (RES) SS-1 (MS/MSD 4)

# General Chemistry

Lot-Sample #...: A8E060157-022 Work Order #...: CH00X
Date Sampled...: 05/04/98 15:55 Date Received..: 05/06/98

Matrix....: SOLID

\* Moisture....: 8.7

PREPARATION-PREP

PARAMETER

RL

UNITS METHOD ANALYSIS DATE BATCH #

Percent Solids

0.10 91.3

MCAWW 160.3 MOD 05/07-05/08/98 8127139

Dilution Factor: 1

NOTE (S):

RL Reporting Limit

# Client Sample ID: RFI-I (RES) SS-28

# GC Semivolatiles

Lot-Sample #: Date Sampled: Prep Date: Prep Batch #:	05/04/98 17:10 05/13/98	Work Order #: Date Received: Analysis Date:	05/06/98	Matrix: SOLID
Dilution Factor:	1			
% Moisture:	8.5	Method:	SW846 8082	
			REPORTING	
PARAMETER		RESULT	LIMIT	UNITS
Aroclor 1016		ND	36	ug/kg
Aroclor 1221		ND	36	ug/kg
Aroclor 1232		ND	36	ug/kg
Aroclor 1242		ND	36	ug/kg
Aroclor 1248		ND	36	ug/kg
Aroclor 1254		ND	36	ug/kg
ALOCIOI 1234				/2

36

ug/kg

	PERCENT	LIMITS
SURROGATE	RECOVERY	
Tetrachloro-m-xylene	113	(8.0- 129)
Decachlorobiphenyl	142 *	(0.0- 138)

ND

OTE(S):

Aroclor 1260

<sup>\*</sup> Surrogate recovery is outside stated control limits.

# Client Sample ID: RFI-I (RES) SS-28

### TOTAL Metals

Lot-Sample #...: A8E060157-023 Matrix....: SOLID

Date Sampled...: 05/04/98 17:10 Date Received..: 05/06/98

\* Moisture....: 8.5

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch # Arsenic	: 8135119 1320	1090 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH015102
Cobalt	6480	5460 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH015103

NOTE (S):

Client Sample ID: RFI-I (RES) SS-28

### General Chemistry

Lot-Sample #...: A8E060157-023 Work Order #...: CH015

Matrix....: SOLID

Date Sampled...: 05/04/98 17:10 Date Received..: 05/06/98

% Moisture....: 8.5

PREPARATION-

PARAMETER

RESULT

UNITS

METHOD

ANALYSIS DATE BATCH #

Percent Solids

0.10 91.5

Dilution Factor: 1

MCAWW 160.3 MOD

05/07-05/08/98 8127139

NOTE (S):

RL Reporting Limit

# Client Sample ID: RFI-I (RES) SS-22

### GC Semivolatiles

Tat Cample # .	A8E060157-024	Work Order #	:	CH016104	Matrix: SOL	חדי
LOC-Sample #	MODOCOTO, ODY			THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.		

Date Sampled...: 05/04/98 18:30 Date Received..: 05/06/98 Prep Date....: 05/13/98 Analysis Date..: 05/29/98

Prep Batch # ...: 8133101

Dilution Factor: 10

\* Moisture....: 7.9 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS	
Aroclor 1016	ND	360	ug/kg	
Aroclor 1221	ND	360	ug/kg	
Aroclor 1232	ND	360	ug/kg	
Aroclor 1242	ND	360	ug/kg	
Aroclor 1248	ND	360	ug/kg	
Aroclor 1254	ND	360	ug/kg	
Aroclor 1260	ND	360	ug/kg	
	PERCENT	RECOVERY		
SURROGATE	RECOVERY	LIMITS	_	
Tetrachloro-m-xylene	79 DIL	(8.0- 129		
Decachlorobiphenyl	146 DIL,*	(0.0- 138	)	

#### NOTE (S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

Client Sample ID: RFI-I (RES) SS-22

# TOTAL Metals

Lot-Sample #...: A8E060157-024

Date Sampled...: 05/04/98 18:30 Date Received..: 05/06/98

\* Moisture....: 7.9

* EDIBCUIC						
PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch # Arsenic	: 8135119 1460	1090 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH016102
Cobalt	9950	5430 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH016103

NOTE (S):

Client Sample ID: RFI-I (RES) SS-22

# General Chemistry

Lot-Sample #...: A8E060157-024 Work Order #...: CH016
Date Sampled...: 05/04/98 18:30 Date Received..: 05/06/98

Matrix....: SOLID

% Moisture....: 7.9

PREP PREPARATION-ANALYSIS DATE BATCH # UNITS METHOD RESULT RL PARAMETER 05/07-05/08/98 8127139 MCAWW 160.3 MOD 0.10 Percent Solids 92.1

Dilution Factor: 1

. . . "

NOTE (S):

RL Reporting Limit

# Client Sample ID: RFI-I (RES) SS-23

### GC Semivolatiles

Lot-Sample #:	A8E060157-025	Work	Order #:	CH01A104	Matrix SOLID
Doc bampas ii	05/04/00 17.50	Date	Peceived .	05/06/98	

Date Sampled...: 05/04/98 17:50 Date Received..: 05/06/98 Prep Date....: 05/13/98 Analysis Date..: 05/25/98

Prep Batch #...: 8133101

Dilution Factor: 1

% Moisture....: 9.5 Method....: SW846 8082

PARAMETER	RESULT	LIMIT	UNITS
Aroclor 1016	ND	36	ug/kg
Aroclor 1221	ND	36	ug/kg
Aroclor 1232	ND	36	ug/kg
Aroclor 1242	ND	36	ug/kg
Aroclor 1248	ND	36	ug/kg
Aroclor 1254	ND	36	ug/kg
Aroclor 1260	ND	36	ug/kg
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	
Tetrachloro-m-xylene	100	(8.0- 12	
Decachlorobiphenyl	106	(0.0- 13	8)

# Client Sample ID: RFI-I (RES) SS-23

### TOTAL Metals

Matrix....: SOLID Lot-Sample #...: A8E060157-025

Date Sampled...: 05/04/98 17:50 Date Received..: 05/06/98 % Moisture....: 9.5

* moisture						
PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #. Arsenic	1510	1100 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH01A102
Cobalt	7160	5520 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH01A103

Client Sample ID: RFI-I (RES) SS-23

### General Chemistry

Lot-Sample #...: A8E060157-025 Work Order #...: CH01A

Matrix....: SOLID

Date Sampled...: 05/04/98 17:50 Date Received..: 05/06/98

% Moisture....: 9.5

PREPARATION-

PARAMETER

METHOD

ANALYSIS DATE BATCH #

Percent Solids

RESULT RL UNITS 0.10 90.5

MCAWW 160.3 MOD 05/07-05/08/98 8127139

Dilution Factor: 1

NOTE (S):

RL Reporting Limit

# Client Sample ID: FIELD DUPLICATE 5

# GC Semivolatiles

Lot-Sample #: A8E060157-026 Date Sampled: 05/04/98 15:55 Prep Date: 05/12/98 Prep Batch #: 8132107	Work Order #: Date Received: Analysis Date:	05/06/98	Matrix: SOLID
Dilution Factor: 1 * Moisture: 9.6	Method:	SW846 8081	A
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 3.6	UNITS ug/kg
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS (8.0- 129)	
Tetrachloro-m-xylene Decachlorobiphenyl	170 *	(0.0- 138)	

# NOTE (S):

Surrogate recovery is outside stated control limits.

# Client Sample ID: FIELD DUPLICATE 5

# GC Semivolatiles

Lot-Sample #: A8E060157-026 Wo	rk Order #:	CH01G103	Matrix	SOLID
--------------------------------	-------------	----------	--------	-------

Date Sampled...: 05/04/98 15:55 Date Received..: 05/06/98 Prep Date....: 05/12/98 Analysis Date..: 05/27/98

Prep Batch #...: 8132108

Dilution Factor: 1
% Moisture....: 9.6

Method.....: SW846 8082

PARAMETER	RESULT	REPORTIN LIMIT	UNITS	
Aroclor 1016	ND	36	ug/kg	
Aroclor 1221	ND	36	ug/kg	
Aroclor 1232	ND	36	ug/kg	
Aroclor 1242	ND	36	ug/kg	
Aroclor 1248	ND	36	ug/kg	
Aroclor 1254	ND	36	ug/kg	
Aroclor 1260	ND	36	ug/kg	
	PERCENT	RECOVERY		
SURROGATE	RECOVERY	LIMITS		
Tetrachloro-m-xylene	78	(8.0- 12		
Decachlorobiphenyl	81	(0.0- 13	(8)	

TR (S)

# Client Sample ID: FIRLD DUPLICATE 5

# General Chemistry

Lot-Sample #...: A8E060157-026 Work Order #...: CH01G
Date Sampled...: 05/04/98 15:55 Date Received..: 05/06/98 Matrix....: SOLID

\* Moisture....: 9.6

PREPARATION-ANALYSIS DATE BATCH # UNITS METHOD RESULT RL MCAWW 160.3 MOD 05/07-05/08/98 8127139 PARAMETER 0.10 90.4 Percent Solids

Dilution Factor: 1

### NOTE (S):

RL Reporting Limit

# Client Sample ID: FIELD DUPLICATE 6

### GC Semivolatiles

Lot-Sample #: A8E060157-027	Work Order #: CH01L104	Matrix SOLID
-----------------------------	------------------------	--------------

Date Sampled...: 05/04/98 17:10 Date Received..: 05/06/98 Prep Date....: 05/13/98 Analysis Date..: 05/29/98

Prep Batch #...: 8133101

Dilution Factor: 10

% Moisture....: 8.2 Method....: SW846 8082

PARAMETER	RESULT	LIMIT	UNITS	
Aroclor 1016	ND	360	ug/kg	
Aroclor 1221	ND	360	ug/kg	
Aroclor 1232	ND	360	ug/kg	
Aroclor 1242	ND	360	ug/kg	
Aroclor 1248	ND	360	ug/kg	
Aroclor 1254	ND	360	ug/kg	
Aroclor 1260	ND	360	ug/kg	
	PERCENT	RECOVERY		
SURROGATE	RECOVERY	LIMITS	_	
Tetrachloro-m-xylene	88 DIL	(8.0- 12	9)	
Decachlorobiphenyl	134 DIL	(0.0- 13	8)	

#### OTR(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

# Client Sample ID: FIRLD DUPLICATE 6

### TOTAL Metals

Matrix....: SOLID Lot-Sample #...: A8E060157-027

Date Sampled...: 05/04/98 17:10 Date Received..: 05/06/98

* Moisture	: 8.2					
PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch # Arsenic	: 8135119 1470	1090 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH01L102
Cobalt	6570	5450 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH01L103

## Client Sample ID: FIELD DUPLICATE 6

# General Chemistry

Lot-Sample #...: A8E060157-027 Work Order #...: CH01L

Matrix....: SOLID

Date Sampled...: 05/04/98 17:10 Date Received..: 05/06/98

% Moisture....: 8.2

PREPARATION- PREP

RL UNITS RESULT

METHOD

ANALYSIS DATE BATCH #

Percent Solids

0.10 91.8

MCAWW 160.3 MOD 05/07-05/08/98 8127139

Dilution Factor: 1

NOTE (S):

RL Reporting Limit

# Client Sample ID: RFI-1 (RES) SS-24 (MS/MSD5)

### GC Semivolatiles

Lot-Sample #:	A8E060157-028	Work Order #:	CH02L104	Matrix: SOLID
			/ /	

Date Sampled...: 05/04/98 19:20 Date Received..: 05/06/98 Prep Date....: 05/13/98 Analysis Date..: 05/25/98

Prep Batch #...: 8133101

Dilution Factor: 1

Method....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	39	ug/kg
Aroclor 1221	ND	39	ug/kg
Aroclor 1232	ND	39	ug/kg
Aroclor 1242	ND	39	ug/kg
Aroclor 1248	ND	39	ug/kg
Aroclor 1254	ND	39	ug/kg
Aroclor 1260	ND	39	ug/kg
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	_ to the second
Tetrachloro-m-xylene	108	(8.0- 129	
Decachlorobiphenyl	117	(0.0- 138	:)

NOTE (S):

# Client Sample ID: RFI-1 (RES) SS-24 (MS/MSD5)

### TOTAL Metals

Lot-Sample #...: A8E060157-028 Matrix....: SOLID

Date Sampled...: 05/04/98 19:20 Date Received..: 05/06/98

\* Moisture ....: 16

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #. Arsenic	: 8135119 1380	1200 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH02L102
Cobalt	ND	5980 Dilution Factor: 1	ug/kg	SW846 6010A	05/15-05/18/98	CH02L103

NOTE (S) :

Client Sample ID: RFI-1 (RES) SS-24 (MS/MSD5)

### General Chemistry

Lot-Sample #...: A8E060157-028 Work Order #...: CH02L Matrix.....: SOLID

Date Sampled...: 05/04/98 19:20 Date Received..: 05/06/98

\* Moisture....: 16

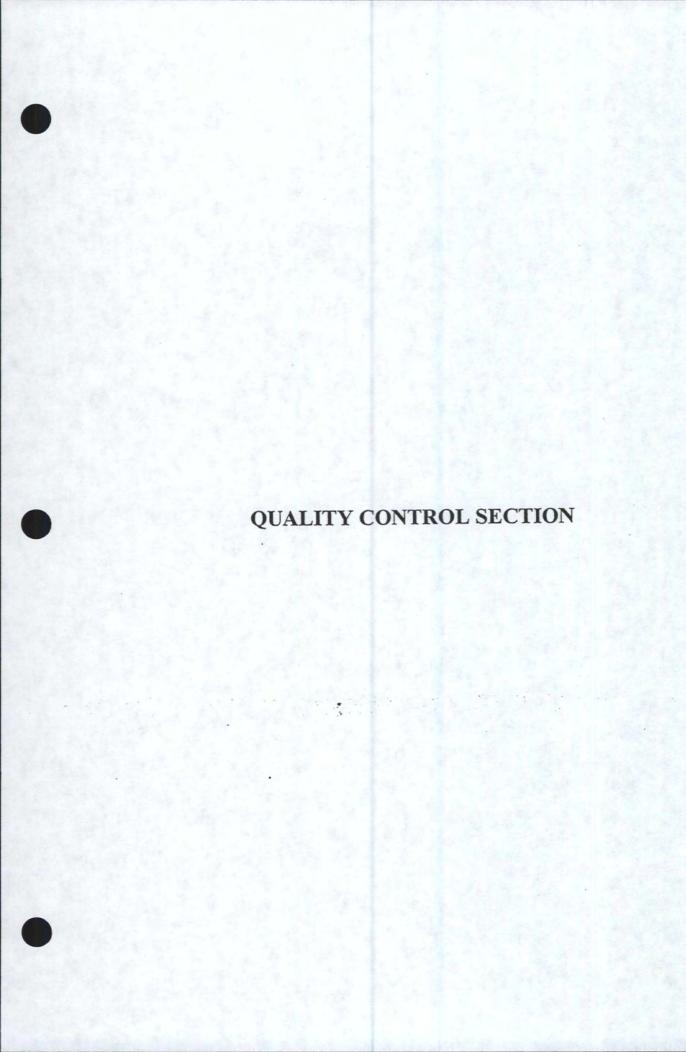
 PARAMETER
 RESULT
 RL
 UNITS
 METHOD
 ANALYSIS DATE
 BATCH #

 Percent Solids
 83.6
 0.10
 %
 MCAWW 160.3 MOD
 05/07-05/08/98
 8127139

Dilution Factor: 1

### NOTE (S):

RL Reporting Limit



# QUALITY CONTROL ELEMENTS OF SW-846 METHODS

Quanterra® Incorporated conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

OC BATCH

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. Quanterra requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. Failure to meet the established recovery guidelines requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). Failure of the RPDs to fall within the laboratory-generated acceptance windows requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the MS/MSD RPDs are within acceptance criteria, the batch is acceptable.

METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except for the common laboratory contaminants indicated below.

Volatile (GC or GC/MS)	Semivolatile (GC/MS)	Metals
Methylene chloride Acetone 2-Butanone	Phthalate Esters	Copper Iron Zinc Lead*

<sup>\*</sup> for analyses run on TJA Trace ICP or GFAA only

# QUALITY CONTROL ELEMENTS OF SW-846 METHODS (continued)

METHOD BLANK (continued)

The listed volatile and semivolatile compounds may be present in concentrations up to 5 times the reporting limits. The listed metals may be present in concentrations up to 2 times the reporting limit or must be twenty fold less than the results of the environmental samples. Failure to meet these Method Blank criteria requires the repreparation and reanalysis of all samples in the QC batch.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. When these values fail to meet acceptance criteria, the data is reviewed to determine the cause. If, in the analyst's judgment, sample matrix effects are indicated, no corrective action is performed. Otherwise, the MS/MSD and the environmental sample used to prepare them are reprepared and reanalyzed.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch.

SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample are spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

The acceptance criteria do not apply to samples that are diluted. If the dilution is more than 5X, the recoveries will be reported as diluted out. All other surrogate recoveries will be reported. If the LCS, LCSD, or the Method Blank surrogates fail to meet recovery criteria (exception for dilutions), the entire batch of samples is reprepared and reanalyzed.

If the surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank and the associated sample(s) are ND, the batch is acceptable. If the surrogate recoveries are outside criteria for environmental or MS/MSD samples, the batch may be acceptable based on the analyst's judgment that sample matrix effects are indicated.

For the GC/MS BNA methods, the surrogate criteria is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide/PCB, PAH, TPH, and Herbicide methods, the surrogate criteria is that one of two surrogate compounds meet acceptance criteria.

# GC/MS Volatiles

Client Lot #...: A8E060157 Work Order #...: CH4N3102 Matrix.....: WATER

LCS Lot-Sample#: A8E130000-164

Prep Date....: 05/12/98 Analysis Date..: 05/12/98

Prep Batch #...: 8133164

Dilution Factor: 1

PERCENT RECOVERY	RECOVERY LIMITS	METHOD
1,1-Dichloroethene 112	(87 - 113)	SW846 8260A
Trichloroethene 98	(89 - 115)	SW846 8260A
Chlorobenzene 105	(89 - 119)	SW846 8260A
Toluene 107	(81 - 117)	SW846 8260A
Benzene 107	(77 - 126)	SW846 8260A
	PERCENT	RECOVERY
SURROGATE	RECOVERY	LIMITS
1,2-Dichloroethane-d4	85	(69 - 127)
Toluene-d8	98	(90 - 112)
Bromofluorobenzene	99	(87 - 114)

### NOTE (S):

ulations are performed before rounding to avoid round-off errors in calculated results.

d print denotes control parameters

# GC/MS Volatiles

Client Lot #...: A8E060157 Work Order #...: CH6CN102 Matrix.....: WATER

LCS Lot-Sample#: A8E140000-287

Prep Date....: 05/14/98 Analysis Date..: 05/14/98

Prep Batch #...: 8134287

Dilution Factor: 1

PARAMETER	PERCENT	RECOVERY LIMITS	METHOD
1,1-Dichloroethene	95	(87 - 113)	SW846 8260A
Trichloroethene	91	(89 - 115)	SW846 8260A
Chlorobenzene	100	(89 - 119)	SW846 8260A
Toluene	97	(81 - 117)	SW846 8260A
Benzene	95	(77 - 126)	SW846 8260A
		PERCENT	RECOVERY
SURROGATE		RECOVERY	LIMITS
1,2-Dichloroethane-d4		88	(69 - 127)
Toluene-d8		98	(90 - 112)
Bromofluorobenzene		92	(87 - 114)

# NOTE (S):

lculations are performed before rounding to avoid round-off errors in calculated results.

old print denotes control parameters

# GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CH1HH102 Matrix.....: WATER

LCS Lot-Sample#: A8E080000-110

Prep Date....: 05/08/98 Analysis Date..: 05/27/98

Prep Batch # ...: 8128110

Dilution Factor: 1

DADAMETED	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	
PARAMETER	83	(63 - 122)	SW846 8081A	
Lindane	86	(56 - 125)	SW846 8081A	
Heptachlor Aldrin	70	(60 - 117)	SW846 8081A	
Dieldrin	90	(63 - 122)	SW846 8081A	
Endrin	66	(48 - 129)	SW846 8081A	
4,4'-DDT	85	(55 - 128)	SW846 8081A	
		PERCENT	RECOVERY	
SURROGATE		RECOVERY	LIMITS	
Tetrachloro-m-xylene		54	(10 - 130)	
Decachlorobiphenyl		70	(10 - 116)	

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

### GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CH3NF102 Matrix.....: SOLID

LCS Lot-Sample#: A8E120000-107

Prep Date....: 05/12/98 Analysis Date..: 05/30/98

Prep Batch #...: 8132107

Dilution Factor: 1

PARAMETER		PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Lindane		59	(52 - 108)	SW846 8081A
Heptachlor		58	(53 - 130)	SW846 8081A
Aldrin		49	(43 - 116)	SW846 8081A
Dieldrin		62	(62 - 107)	SW846 8081A
Endrin		66	(64 - 127)	SW846 8081A
4,4'-DDT		74	(52 - 128)	SW846 8081A
			PERCENT	RECOVERY
SURROGATE			RECOVERY	LIMITS
Tetrachloro-m-xylene	_		68	(8.0- 129)
Decachlorobiphenyl			64	(0.0- 138)

#### NOTE (S)

alculations are performed before rounding to avoid round-off errors in calculated results.

Sold print denotes control parameters

### GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CH1HX102 Matrix.....: WATER

LCS Lot-Sample#: A8E080000-113

Prep Date....: 05/08/98 Analysis Date..: 05/27/98

Prep Batch # ...: 8128113

Dilution Factor: 2

Decachlorobiphenyl

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Aroclor 1016	89	(66 - 111)	SW846 8082
Aroclor 1260	95	(65 - 111)	SW846 8082
		PERCENT	RECOVERY
SURROGATE		RECOVERY	LIMITS
Tetrachloro-m-xylene		97	(10 - 130)

100

(10 - 116)

NOTE (S):

### GC Semivolatiles

Matrix....: SOLID Work Order #...: CH4JD102 Client Lot # ...: A8E060157

LCS Lot-Sample#: A8E130000-101

Analysis Date..: 05/20/98 Prep Date....: 05/13/98

Prep Batch #...: 8133101

Dilution Factor: 5

RECOVERY PERCENT

METHOD RECOVERY LIMITS PARAMETER SW846 8082 (60 - 133)Aroclor 1016 96 SW846 8082 (59 - 129)105 Aroclor 1260

RECOVERY PERCENT LIMITS RECOVERY SURROGATE (8.0- 129) Tetrachloro-m-xylene 89

(0.0 - 138)118 Decachlorobiphenyl

# GC Semivolatiles

Work Order #...: CH3NG102 Matrix....: SOLID Client Lot # ...: A8E060157

LCS Lot-Sample#: A8E120000-108

Analysis Date..: 05/27/98 Prep Date....: 05/12/98

Prep Batch #...: 8132108

Dilution Factor: 2

RECOVERY PERCENT METHOD LIMITS RECOVERY PARAMETER SW846 8082 (60 - 133)Aroclor 1016 SW846 8082 (59 - 129)100 Aroclor 1260

PERCENT RECOVERY LIMITS RECOVERY SURROGATE (8.0- 129) 98

Tetrachloro-m-xylene (0.0 - 138)115 Decachlorobiphenyl

NOTE (S):

#### TOTAL Metals

Client Lot #...: A8E060157 Matrix.....: WATER

PERCENT RECOVERY PREPARATION-

PARAMETER RECOVERY LIMITS METHOD ANALYSIS DATE WORK ORDER #

LCS Lot-Sample#: A8E120000-253 Prep Batch #...: 8132253

Cobalt 96 (83 - 107) SW846 6010A 05/13-05/18/98 CH4EA103

Dilution Factor: 1

Arsenic 92 (86 - 114) SW846 6010A 05/13-05/18/98 CH4EA104

Dilution Factor: 1

NOTE (S):

### TOTAL Metals

Client Lot #...: A8E060157 Matrix....: SOLID

PERCENT RECOVERY PREPARATION-

PARAMETER RECOVERY LIMITS METHOD ANALYSIS DATE WORK ORDER #

LCS Lot-Sample#: A8E150000-119 Prep Batch #...: 8135119

Cobalt 93 (80 - 104) SW846 6010A 05/15-05/18/98 CH6F4102

Dilution Factor: 1

Arsenic 87 (80 - 106) SW846 6010A 05/15-05/18/98 CH6F4104

Dilution Factor: 1

NOTE (S):

## General Chemistry

Client Lot #...: A8E060157

Matrix..... WATER

PERCENT

RECOVERY

PREPARATION-

PREP

PARAMETER

ANALYSIS DATE

RECOVERY LIMITS METHOD

BATCH #

Amenable Cyanide

Work Order #: CH74N104 LCS Lot-Sample#: A8E150000-242

75

(70 - 130) SW846 9012 Dilution Factor: 2

05/15-05/18/98 8135242

## GC/MS Volatiles

Client Lot # ...: A8E060157

Work Order #...: CH4N3101

Matrix....: WATER

SW846 8260A

SW846 8260A

SW846 8260A

SW846 8260A

MB Lot-Sample #: A8E130000-164

Prep Date....: 05/12/98

REPORTING

Analysis Date..: 05/12/98

Prep Batch #...: 8133164

Dilution Factor: 1

PARAMETER

Acetonitrile

Acrylonitrile

Allyl chloride

Bromodichloromethane

Carbon tetrachloride

Dibromochloromethane

trans-1,4-Dichloro-

1,1-Dichloroethane

1,2-Dichloroethane

1,1-Dichloroethene

1,2-Dichloropropane

Ethyl methacrylate

Isobutyl alcohol

Methacrylonitrile

ethylene chloride

thyl methacrylate

4-Methyl-2-pentanone

1,2-Dibromo-3-chloro-

1,2-Dibromoethane (EDB)

Dichlorodifluoromethane

trans-1,2-Dichloroethene

cis-1,3-Dichloropropene

trans-1,3-Dichloropropene

Acetone

Acrolein

Renzene

Bromoform

Bromomethane

Chlorobenzene

loroform

Chloroprene

propane

Dibromomethane

2-butene

Ethylbenzene

2-Hexanone

(MIBK)

Iodomethane

Chloromethane

loroethane

2-Butanone (MEK)

Carbon disulfide

METHOD UNITS RESULT LIMIT SW846 8260A 10 ug/L ND SW846 8260A 20 ug/L ND SW846 8260A ug/L 20 ND SW846 8260A ug/L ND 20 SW846 8260A 2.0 ug/L ND SW846 8260A 1.0 ug/L ND SW846 8260A 1.0 ug/L ND SW846 8260A ug/L 1.0 ND SW846 8260A uq/L 2.0 ND SW846 8260A ug/L 10 ND SW846 8260A ug/L 1.0 ND SW846 8260A ug/L 1.0 ND SW846 8260A ug/L 1.0 ND SW846 8260A 2.0 ug/L ND SW846 8260A 0.25 ug/L ND SW846 8260A ug/L 2.0 ND SW846 8260A 1.0 ug/L ND SW846 8260A 1.0 ug/L ND SW846 8260A ug/L 2.0 SW846 8260A ug/L 1.0 ND SW846 8260A ug/L 1.0 ND SW846 8260A ug/L 5.0 ND SW846 8260A 2.0 ug/L ND SW846 8260A 1.0 uq/L ND SW846 8260A ug/L 1.0 ND SW846 8260A 1.0 ug/L ND SW846 8260A ug/L 0.50 ND SW846 8260A ug/L 1.0 ND SW846 8260A 1.0 ug/L ND SW846 8260A 1.0 ug/L ND SW846 8260A ug/L 1.0 ND SW846 8260A 1.0 ug/L ND SW846 8260A ug/L 10 ND SW846 8260A 1.0 ug/L ND SW846 8260A ug/L

ND

ND

ND

ND

ND

40

10

1.0

1.0

10

ug/L

ug/L

ug/L

ug/L

# GC/MS Volatiles

Client Lot #: A8E060157	Work Order #: CH4N	N3101 Matrix	: WATER

		REPORTIN	1G		
PARAMETER	RESULT	LIMIT	UNITS	METHOD	
Propionitrile	ND	4.0	ug/L	SW846	8260A
Styrene	ND	1.0	ug/L	SW846	
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	SW846	8260A
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846	8260A
retrachloroethene	ND	1.0	ug/L	SW846	8260A
Coluene	ND	1.0	ug/L	SW846	8260A
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846	8260A
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846	8260A
Trichloroethene	ND	1.0	ug/L	SW846	8260A
Frichlorofluoromethane	ND	2.0	ug/L	SW846	8260A
1,2,3-Trichloropropane	ND	1.0	ug/L	SW846	8260A
Vinyl acetate	ND	2.0	ug/L	SW846	8260A
Vinyl chloride	ND	2.0	ug/L	SW846	8260A
Kylenes (total)	ND	1.0	ug/L	SW846	8260A
m-Dichlorobenzene	ND	1.0	ug/L	SW846	8260A
p-Dichlorobenzene	ND	1.0	ug/L	SW846	8260A
o-Dichlorobenzene	ND	1.0	ug/L	SW846	8260A
	PERCENT	RECOVERY			
SURROGATE	RECOVERY	LIMITS			
1,2-Dichloroethane-d4	89	(69 - 1	.27)		
Toluene-d8	96	(90 - 1	.12)		
Bromofluorobenzene	100	(87 - 114)			

NOTE (S):

# GC/MS Volatiles

Client Lot # ...: A8E060157

Work Order #...: CH6CN101

Matrix....: WATER

MB Lot-Sample #: A8E140000-287

Prep Date....: 05/14/98

Analysis Date..: 05/14/98 Dilution Factor: 1

Prep Batch #...: 8134287

REPORTING

		REPORTIN	The second second	MERILOD	
PARAMETER	RESULT	LIMIT UNITS		METHOD	
Acetone	ND	10	ug/L	SW846 8260A	
Acetonitrile	ND	20	ug/L	SW846 8260A	
Acrolein	ND	20	ug/L	SW846 8260A	
Acrylonitrile	ND	20	ug/L	SW846 8260A	
Allyl chloride	ND	2.0	ug/L	SW846 8260A	
Benzene	ND	1.0	ug/L	SW846 8260A	
Bromodichloromethane	ND	1.0	ug/L	SW846 8260A	
Bromoform	ND	1.0	ug/L	SW846 8260A	
Bromomethane	ND	2.0	ug/L	SW846 8260A	
2-Butanone (MEK)	ND	10	ug/L	SW846 8260A	
Carbon disulfide	ND	1.0	ug/L	SW846 8260A	
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260A	
Chlorobenzene	ND	1.0	ug/L	SW846 8260A	
oroethane	ND	2.0	ug/L	SW846 8260A	
oroform	ND	0.25	ug/L	SW846 8260A	
Chloromethane	ND	2.0	ug/L	SW846 8260A	
Chloroprene	ND	1.0	ug/L	SW846 8260A	
Dibromochloromethane	ND	1.0	ug/L	SW846 8260A	
1,2-Dibromo-3-chloro-	ND	2.0	ug/L	SW846 8260A	
propane					
1,2-Dibromoethane (EDB)	ND	1.0	ug/L	SW846 8260A	
Dibromomethane	ND	1.0	ug/L	SW846 8260A	
trans-1,4-Dichloro-	ND	5.0	ug/L	SW846 8260A	
2-butene			3,		
Dichlorodifluoromethane	ND	2.0	ug/L	SW846 8260A	
1,1-Dichloroethane	ND •	1.0	ug/L	SW846 8260A	
	ND	1.0	ug/L	SW846 8260A	
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260A	
1,1-Dichloroethene	ND	0.50	ug/L	SW846 8260A	
trans-1,2-Dichloroethene		1.0	ug/L	SW846 8260A	
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260A	
cis-1,3-Dichloropropene	ND		ug/L	SW846 8260A	
trans-1,3-Dichloropropene	ND	1.0		SW846 8260A	
Ethylbenzene	ND	1.0	ug/L	SW846 8260A	
Ethyl methacrylate	ND	1.0	ug/L	SW846 8260A	
2-Hexanone	ND	10	ug/L	SW846 8260A	
Iodomethane	ND	1.0	ug/L		
Isobutyl alcohol	ND	40	ug/L	SW846 8260A	
Methacrylonitrile	ND	10	ug/L	SW846 8260A	
Methylene chloride	ND	1.0	ug/L	SW846 8260A	
hyl methacrylate	ND	1.0	ug/L	SW846 8260A	
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	SW846 8260A	

# GC/MS Volatiles

Client Lot #...: A8E060157 Work Order #...: CH6CN101 Matrix.....: WATER

		REPORTIN	NG		
PARAMETER	RESULT	LIMIT	UNITS	METHOD	
Propionitrile	ND	4.0	ug/L	SW846 8260A	
Styrene	ND	1.0	ug/L	SW846 8260A	
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260A	
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260A	
Tetrachloroethene	ND	1.0	ug/L	SW846 8260A	
Toluene	ND	1.0	ug/L	SW846 8260A	
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260A	
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260A	
Trichloroethene	ND	1.0	ug/L	SW846 8260A	
Trichlorofluoromethane	ND	2.0	ug/L	SW846 8260A	
1,2,3-Trichloropropane	ND	1.0	ug/L	SW846 8260A	
Vinyl acetate	ND	2.0	ug/L	SW846 8260A	
Vinyl chloride	ND	2.0	ug/L	SW846 8260A	
Xylenes (total)	ND	1.0	ug/L	SW846 8260A	
m-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A	
p-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A	
o-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A	
	PERCENT	RECOVERY			
SURROGATE	RECOVERY	LIMITS			
1,2-Dichloroethane-d4	88	(69 - 127)			
Toluene-d8	98	(90 - 112)			
Bromofluorobenzene	92	(87 - 114)			

NOTE (S):

#### GC Semivolatiles

Client Lot # ...: A8E060157

Work Order #...: CH1HH101

Matrix..... WATER

MB Lot-Sample #: A8E080000-110

Prep Date....: 05/08/98

Analysis Date..: 05/27/98

Prep Batch # ...: 8128110

Dilution Factor: 1

Tetrachloro-m-xylene

Decachlorobiphenyl

REPORTING

PARAMETER	RESULT	LIMIT	UNITS	METHOD
Hexachlorobenzene	ND	0.050	ug/L	SW846 8081A

 PERCENT
 RECOVERY

 RECOVERY
 LIMITS

 50
 (10 - 130)

 67
 (10 - 116)

NOTE (S):

SURROGATE

#### GC Semivolatiles

Client Lot # ...: A8E060157

Work Order #...: CH3NF101

Matrix..... SOLID

MB Lot-Sample #: A8E120000-107

Prep Date....: 05/12/98

Analysis Date..: 06/03/98

Prep Batch # ...: 8132107

Dilution Factor: 1

Tetrachloro-m-xylene

Decachlorobiphenyl

REPORTING

PARAMETER	RESULT	LIMIT	UNITS	METHOD
Hexachlorobenzene	ND	3.3	ug/kg	SW846 8081A

PERCENT RECOVERY

RECOVERY

98 (8.0- 129)

188 \* (0.0- 138)

NOTE (S):

SURROGATE

<sup>\*</sup> Surrogate recovery is outside stated control limits.

#### GC Semivolatiles

Client Lot #...: A8E060157

Work Order #...: CH1HX101

Matrix....: WATER

MB Lot-Sample #: A8E080000-113

Prep Date....: 05/08/98

Analysis Date..: 05/27/98

Prep Batch # ...: 8128113

Dilution Factor: 1

REPORTING

PARAMETER	RESULT	LIMIT	UNITS	METHOD
Aroclor 1016	ND	1.0	ug/L	SW846 8082
Aroclor 1221	ND	1.0	ug/L	SW846 8082
Aroclor 1232	ND	1.0	ug/L	SW846 8082
Aroclor 1242	ND	1.0	ug/L	SW846 8082
Aroclor 1248	ND	1.0	ug/L	SW846 8082
Aroclor 1254	ND	1.0	ug/L	SW846 8082
Aroclor 1260	ND	1.0	ug/L	SW846 8082
	PERCENT	RECOVER	Y	
SURROGATE	RECOVERY	LIMITS		
Tetrachloro-m-xylene	84	(10 - 1	30)	
Decachlorobiphenyl	90	(10 - 1	16)	

OTE (S):

## GC Semivolatiles

Client Lot #...: A8E060157

Work Order #...: CH4JD101

Matrix....: SOLID

MB Lot-Sample #: A8E130000-101

Prep Date....: 05/13/98

Analysis Date..: 05/20/98

Prep Batch #...: 8133101

Dilution Factor: 1

REPORTING

PARAMETER	RESULT	LIMIT	UNITS	METHOD
Aroclor 1016	ND	33	ug/kg	SW846 8082
Aroclor 1221	ND	33	ug/kg	SW846 8082
Aroclor 1232	ND	33	ug/kg	SW846 8082
Aroclor 1242	ND	33	ug/kg	SW846 8082
Aroclor 1248	ND	33	ug/kg	SW846 8082
Aroclor 1254	ND	33	ug/kg	SW846 8082
Aroclor 1260	ND	33	ug/kg	SW846 8082
	PERCENT	RECOVER	Y	
SURROGATE	RECOVERY	LIMITS		
Tetrachloro-m-xylene	85	(8.0- 1	29)	
Decachlorobiphenyl	93	(0.0- 1	38)	

TE(S):

#### GC Semivolatiles

Client Lot # ...: A8E060157

Work Order #...: CH3NG101

Matrix....: SOLID

MB Lot-Sample #: A8E120000-108

Prep Date....: 05/12/98

Analysis Date..: 05/27/98

Prep Batch #...: 8132108

Dilution Factor: 1

REPORTING

RESULT	LIMIT	UNITS	METHOD
ND	33	ug/kg	SW846 8082
ND	33	ug/kg	SW846 8082
ND	33	ug/kg	SW846 8082
ND	.33	ug/kg	SW846 8082
ND	33	ug/kg	SW846 8082
	33	ug/kg	SW846 8082
ND	33	ug/kg	SW846 8082
PERCENT		Y	
-		29)	
	ND ND ND ND ND ND ND ND	ND 33 PERCENT RECOVER RECOVERY LIMITS 82 (8.0- 1	ND 33 ug/kg ND 32 ug/kg ND 33 ug/kg ND 33 ug/kg

TE (S):

#### TOTAL Metals

Client Lot # ...: A8E060157

NOTE (S):

Matrix..... WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MB Lot-Sample Arsenic	ND	0-253 Prep Bat 5.0 Dilution Factor: 1	ch #: ug/L	8132253 SW846 6010A	05/13-05/18/98	CH4EA102
Cobalt	ND	7.0 Dilution Factor: 1	ug/L	SW846 6010A	05/13-05/18/98	CH4EA101

## TOTAL Metals

Client Lot #...: A8E060157

PARAMETER	RESULT	LIMIT	UNITS	METHOD		ANALYSIS DATE	ORDER #
MB Lot-Sample #: Arsenic	ND	Prep Ba	tch #: ug/kg	8135119 SW846	6010A	05/15-05/18/98	CH6F4103
Cobalt	ND Diluti	5000 on Factor: 1	ug/kg	SW846	6010A	05/15-05/18/98	CH6F4101

## General Chemistry

Client Lot # ...: A8E060157

NOTE (S):

Matrix....: SOLID

PARAMETER Percent Solids	REPORTING RESULT LIMIT Work Order ND 0.10 Dilution Factor:	UNITS #: CH0K4101	METHOD  MB Lot-Sample #: MCAWW 160.3 MOD	PREPARATION- ANALYSIS DATE A8E070000-137 05/07-05/08/98	PREP BATCH # 8127137
Percent Solids	Work Order ND 0.10 Dilution Factor:	#: CH0K5101	MB Lot-Sample #: MCAWW 160.3 MOD	A8E070000-139 05/07-05/08/98	8127139

#### General Chemistry

Client Lot # ...: A8E060157

Matrix..... WATER

 REPORTING
 PREPARATION- PREP

 PARAMETER
 RESULT
 LIMIT
 UNITS
 METHOD
 ANALYSIS DATE
 BATCH #

 Amenable Cyanide
 Work Order #: CH74N101
 MB Lot-Sample #: A8E150000-242
 A8E150000-242
 SW846 9012
 05/15-05/18/98
 8135242

Dilution Factor: 1

NOTE (S):

## GC/MS Volatiles

Client Lot #...: A8E060157 Work Order #...: CGXGM102-MS Matrix.....: WATER

MS Lot-Sample #: A8E060111-002 CGXGM103-MSD

Date Sampled...: 05/05/98 14:30 Date Received..: 05/06/98 Prep Date....: 05/12/98 Analysis Date..: 05/12/98

Prep Batch #...: 8133164 Dilution Factor: 100

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHO	D
1,1-Dichloroethene	104	(75 - 113)			SW846	8260A
2,2 220	108	(75 - 113)	3.8	(0-20)	SW846	8260A
Trichloroethene	95	(71 - 110)			SW846	8260A
	97	(71 - 110)	2.3	(0-22)	SW846	8260A
Chlorobenzene	102	(81 - 115)			SW846	8260A
CIIIOIODGIIZGIIG	106	(81 - 115)	3.8	(0-18)	SW846	8260A
Toluene	104	(78 - 126)			SW846	8260A
TOTACHE	110	(78 - 126)	5.1	(0-24)	SW846	8260A
Benzene	101	(78 - 117)			SW846	8260A
Benzene	109	(78 - 117)	2.6	(0-17)	SW846	8260A
		PERCENT		RECOVERY		
RROGATE		RECOVERY		LIMITS		
2-Dichloroethane-d4		94		(69 - 12	7)	
Dichiolocomune al		87		(69 - 12	7)	
Toluene-d8		100		(90 - 11:	2)	
Toruene-us		101		(90 - 11:	2)	
Bromofluorobenzene		100		(87 - 11	4)	
BIOMOTITOTODENZENE		102		(87 - 11		

NOTE(S):

#### GC/MS Volatiles

Client Lot #...: A8E060157 Work Order #...: CH3A2104-MS Matrix....: WATER

MS Lot-Sample #: A8E110118-003 CH3A2105-MSD

Date Sampled...: 05/08/98 10:26 Date Received..: 05/09/98 Prep Date....: 05/14/98 Analysis Date..: 05/14/98

Prep Batch #...: 8134287

Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHO	D	
1,1-Dichloroethene	96	(75 - 113)			SW846	8260A	
-,-	94	(75 - 113)	2.1	(0-20)	SW846	8260A	
Trichloroethene	98	(71 - 110)			SW846	8260A	
	97	(71 - 110)	1.2	(0-22)	SW846	8260A	
Chlorobenzene	103	(81 - 115)			SW846	8260A	
	102	(81 - 115)	1.4	(0-18)	SW846	8260A	
Toluene	97	(78 - 126)			SW846	8260A	
10146116	94	(78 - 126)	2.3	(0-24)	SW846	8260A	
Benzene	94	(78 - 117)			SW846	8260A	
201120110	93	(78 - 117)	1.3	(0-17)	SW846	8260A	
		PERCENT		RECOVERY			
PROGATE		RECOVERY		LIMITS	_		
	_	87		(69 - 12	7)		
		81		(69 - 12	7)		
Toluene-d8		94		(90 - 11	2)		
TOTALLIC 40				(90 - 11	2)		
PROGATE RECOVERY 87	(87 - 11	4)					
BIOMOIIGOIOSCHECHC		82 *		(87 - 11	4)		

#### NOTE (S):

<sup>\*</sup> Surrogate recovery is outside stated control limits.

#### GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CGXX9102-MS Matrix....: WATER

MS Lot-Sample #: A8E060157-003 CGXX9103-MSD

Date Sampled...: 05/04/98 18:39 Date Received..: 05/06/98 Prep Date....: 05/08/98 Analysis Date..: 05/27/98

Prep Batch #...: 8128110

Dilution Factor: 1

	PERCENT	RECOVERY		RPD	
PARAMETER	RECOVERY	LIMITS	RPD	LIMITS	METHOD
Lindane	81	(48 - 135)			SW846 8081A
	82	(48 - 135)	1.2	(0-51)	SW846 8081A
Heptachlor	89	(56 - 158)			SW846 8081A
	90	(56 - 158)	2.0	(0-36)	SW846 8081A
Aldrin	72	(54 - 120)			SW846 8081A
	70	(54 - 120)	2.8	(0-40)	SW846 8081A
Dieldrin	96	(54 - 143)			SW846 8081A
	97	(54 - 143)	0.51	(0-32)	SW846 8081A
Endrin	72	(64 - 142)			SW846 8081A
	25 a,p	(64 - 142)	98	(0-39)	SW846 8081A
4,4'-DDT	92	(48 - 154)			SW846 8081A
	91	(48 - 154)	1.4	(0-47)	SW846 8081A
		PERCENT		RECOVERY	
SURROGATE		RECOVERY		LIMITS	and the second second
Tetrachloro-m-xylene		55		(10 - 130	))
		58		(10 - 130	))
Decachlorobiphenyl		67		(10 - 116	5)
		70		(10 - 116	5)

#### NOTE (S) :

a Spiked analyte recovery is outside stated control limits.

p Relative percent difference (RPD) is outside stated control limits.

#### GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CH00K106-MS Matrix....: SOLID

MS Lot-Sample #: A8E060157-019 CH00K107-MSD

Date Sampled...: 05/05/98 14:40 Date Received..: 05/06/98 Prep Date....: 05/12/98 Analysis Date..: 05/29/98

Prep Batch #...: 8132107

Dilution Factor: 1 % Moisture....: 13

DAD AMERICA	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHO	
PARAMETER	70	(28 - 125)		1	SW846	8081A
Lindane	75	(28 - 125)	6.6	(0-51)	SW846	8081A
	78	(24 - 168)			SW846	8081A
Heptachlor	78	(24 - 168)	0.38	(0-73)	SW846	8081A
	66	(31 - 123)			SW846	8081A
Aldrin	62	(31 - 123)	6.1	(0-42)	SW846	8081A
		(32 - 145)			SW846	8081A
Dieldrin	80	(32 - 145)	5.1	(0-43)	SW846	8081A
	84	(32 - 137)	5.2		SW846	8081A
Endrin	83	(32 - 137)	2.1	(0-45)	SW846	8081A
	85	(10 - 151)	2.2	, , , , ,	SW846	8081A
4,4'-DDT	90		17	(0-50)		8081A
	107	(10 - 151)	1,	(0-30)		
		PERCENT		RECOVERY		
SURROGATE		RECOVERY		LIMITS	_	
Tetrachloro-m-xylene	_	54		(8.0- 12	9)	
Tetrachioro-m-xyrene		54		(8.0- 12	9)	
n blamahimbonul		107		(0.0- 13	8)	
Decachlorobiphenyl		108		(0.0- 13	8)	

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

#### GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CH00X106-MS Matrix.....: SOLID

MS Lot-Sample #: A8E060157-022 CH00X107-MSD

Date Sampled...: 05/04/98 15:55 Date Received..: 05/06/98 Prep Date....: 05/12/98 Analysis Date..: 05/29/98

Prep Batch #...: 8132107

ON DAMESTED	PERCENT	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
PARAMETER	44	(28 - 125)			SW846 8081A
Lindane	62	(28 - 125)	33	(0-51)	SW846 8081A
Wantachlor	61	(24 - 168)			SW846 8081A
Heptachlor	78	(24 - 168)	24	(0-73)	SW846 8081A
Aldrin	55	(31 - 123)			SW846 8081A
ALGELII	62	(31 - 123)	13	(0-42)	SW846 8081A
Dieldrin	60	(32 - 145)			SW846 8081A
Dieldrin	81	(32 - 145)	30	(0-43)	SW846 8081A
Endrin	70	(32 - 137)			SW846 8081A
Endrin	87	(32 - 137)	22	(0-45)	SW846 8081A
4,4'-DDT	68	(10 - 151)			SW846 8081A
4,4001	84	(10 - 151)	21	(0-50)	SW846 8081A
		PERCENT		RECOVERY	
SURROGATE		RECOVERY		LIMITS	
Tetrachloro-m-xylene		52		(8.0- 12	
		57		(8.0- 12	
Decachlorobiphenyl		100		(0.0- 13	8)
		108		(0.0- 13	8)

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

#### GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CGXXT104-MS Matrix..... WATER

MS Lot-Sample #: A8E060157-012 CGXXT105-MSD

Date Sampled...: 05/05/98 08:45 Date Received..: 05/06/98 Prep Date....: 05/08/98 Analysis Date..: 05/27/98

Prep Batch #...: 8128113

Dilution Factor: 1

PARAMETER	PERCENT	RECOVERY LIMITS	RPD	RPD LIMITS	METHO	D
Aroclor 1016	83	(42 - 136)		(0.00)	SW846 SW846	
Aroclor 1260	83 90	(42 - 136) (42 - 136)	0.06	(0-29)	SW846	
ALOCIOI 1200	89	(42 - 136)	1.0	(0-29)	SW846	8082
		PERCENT		RECOVERY		
SURROGATE		RECOVERY		LIMITS	_ 8	
Tetrachloro-m-xylene		88		(10 - 130	)	
RESERVED TO THE RESERVED TO TH		89		(10 - 130	)	
Decachlorobiphenyl		98		(10 - 116	()	
		97		(10 - 116	()	

TOTE (S):

alculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

#### GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CH00G106-MS Matrix.....: SOLID

MS Lot-Sample #: A8E060157-018 CH00G107-MSD

Date Sampled...: 05/05/98 13:55 Date Received..: 05/06/98
Prep Date....: 05/13/98 Analysis Date..: 06/02/98

Prep Date....: 05/13/98 Prep Batch #...: 8133101

Dilution Factor: 20 % Moisture....: 16

DADAMETER	PERCENT	RECOVERY LIMITS	RPD	RPD LIMITS	METHO	D
PARAMETER Aroclor 1016	114 DIL	(44 - 139)		(0.00)	SW846 SW846	
	109 DIL 129 DIL	(44 - 139) (44 - 139)	4.5	(0-28)	SW846	
Aroclor 1260	132 DIL	(44 - 139)	2.2	(0-28)	SW846	
		PERCENT		RECOVERY		
SURROGATE		RECOVERY		LIMITS		
Tetrachloro-m-xylene		126 DIL 118 DIL		(8.0- 12 (8.0- 12		
Decachlorobiphenyl		191		(0.0- 13	(8)	
	Qualif	iers: DIL,*		(0.0- 13	38)	
	Qualif	iers: DIL,*				

#### NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

\* Surrogate recovery is outside stated control limits.

#### GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CH00K103-MS Matrix....: SOLID

MS Lot-Sample #: A8E060157-019 CH00K104-MSD

Date Sampled...: 05/05/98 14:40 Date Received..: 05/06/98 Prep Date....: 05/12/98 Analysis Date..: 05/27/98

Prep Batch #...: 8132108

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Aroclor 1016	102	(44 - 139) (44 - 139)	7.3	(0-28)	SW846 8082 SW846 8082
Aroclor 1260	88 105	(44 - 139) (44 - 139)	18	(0-28)	SW846 8082 SW846 8082
SURROGATE		PERCENT		RECOVERY LIMITS (8.0- 12	9)
Tetrachloro-m-xylene		124		(8.0- 12	9)
Decachlorobiphenyl		95 124		(0.0- 13 (0.0- 13	

R(S) :

calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

#### GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CH00X104-MS Matrix.....: SOLID

MS Lot-Sample #: A8E060157-022 CH00X105-MSD

Date Sampled...: 05/04/98 15:55 Date Received..: 05/06/98
Prep Date....: 05/12/98 Analysis Date..: 05/27/98

Prep Batch # ...: 8132108

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHO	D	
Aroclor 1016	75 94	(44 - 139) (44 - 139)	21	(0-28)	SW846 SW846	8082	
Aroclor 1260	75 97	(44 - 139) (44 - 139)	25	(0-28)	SW846		
SURROGATE		PERCENT		LIMITS	<u></u>		
Tetrachloro-m-xylene		78 95		(8.0- 129 (8.0- 129	9)		
Decachlorobiphenyl		100		(0.0- 138 (0.0- 138			

OTE (S):

alculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

#### GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CH02L109-MS Matrix....: SOLID

MS Lot-Sample #: A8E060157-028 CH02L10A-MSD

Date Sampled...: 05/04/98 19:20 Date Received..: 05/06/98 Prep Date....: 05/13/98 Analysis Date..: 05/25/98

Prep Batch # ...: 8133101

PARAMETER	PERCENT	RECOVERY LIMITS	RPD	RPD LIMITS	METHO		
Aroclor 1016	96	(44 - 139)			SW846	8082	
ALOCIOI 1010	97	(44 - 139)	1.1	(0-28)	SW846	8082	
Aroclor 1260	100	(44 - 139)			SW846	8082	
ALOCIOI 1200	101	(44 - 139)	0.11	(0-28)	SW846	8082	
SURROGATE		PERCENT RECOVERY		RECOVERY LIMITS	_		
Tetrachloro-m-xylene		111		(8.0- 12 (8.0- 12			
Decachlorobiphenyl		111		(0.0- 13 (0.0- 13	8)		
		100		100			

TE(S):

acculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

#### TOTAL Metals

Client Lot #...: A8E060157 Matrix....: WATER

Date Sampled...: 05/05/98 08:45 Date Received..: 05/06/98

PARAMETER	PERCENT	RECOVERY LIMITS RPD	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sam Arsenic	93 92	(80 - 120) (80 - 120) 0.90 Dilution Factor: 1	(0-20)	SW846 6010A	05/13-05/18/98 05/13-05/18/98	
Cobalt	97 96	(80 - 120) (80 - 120) 0.96 Dilution Factor: 1		SW846 6010A SW846 6010A	05/13-05/18/98 05/13-05/18/98	

NOTE (S):

#### TOTAL Metals

Client Lot Date Sample	#: A8E06 ed: 05/05	0157 /98 13:55 <b>Date R</b> e	ceived.	.: 05/06/98	Matrix:	SOLID
PARAMETER	PERCENT	100.511	RPD LIMITS	METHOD	T. COLLEGE CO.	WORK ORDER #
MS Lot-Sam	ple #: A8E06 81 81	0157-018 Prep Ba (80 - 120) (80 - 120) 0.12 Dilution Factor: 1		SW846 6010A	05/15-05/18/98 05/15-05/18/98	
Cobalt	109 48 N,*	(80 - 120) (80 - 120) 36 Dilution Factor: 1	(0-20)	SW846 6010A SW846 6010A	05/15-05/18/98 05/15-05/18/98	

#### NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

N Spiked analyte recovery is outside stated control limits.

<sup>\*</sup> Relative percent difference (RPD) is outside stated control limits.

#### TOTAL Metals

Client Lot Date Sampl	#: A8E06	0157 /98 19:20 Date R	eceived.	.: 05/06/98	Matrix: SOLID
PARAMETER	PERCENT	RECOVERY LIMITS RPD	RPD LIMITS	METHOD	PREPARATION- WORK ANALYSIS DATE ORDER #
MS Lot-Sam Arsenic	mple #: A8E06 84 84	(80 - 120) (80 - 120) 0.51 Dilution Factor: 1	(0-20)	SW846 6010A	05/15-05/18/98 CH02L105 05/15-05/18/98 CH02L106
Cobalt	92 95	(80 - 120) (80 - 120) 3.1 Dilution Factor: 1		SW846 6010A SW846 6010A	05/15-05/18/98 CH02L107 05/15-05/18/98 CH02L108

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

## General Chemistry

Client Lot #...: A8E060157 Work Order #...: CGWM7-SMP Matrix....: SOLID

CGWM7 - DUP

Date Sampled...: 05/03/98 09:45 Date Received..: 05/06/98

% Moisture....: 15

84.7

PREPARATION-PREP RPD DUPLICATE ANALYSIS DATE BATCH # LIMIT RESULT UNITS RPD METHOD PARAM RESULT SD Lot-Sample #: A8E050103-003 Percent Solids % 0.11 (0-20) MCAWW 160.3 MOD 05/07-05/08/98 8127137

Dilution Factor: 1

#### NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

84.6

## General Chemistry

Client Lot #...: A8E060157 Work Order #...: CGWM8-SMP Matrix.....: SOLID

CGWM8 - DUP

Date Sampled...: 05/03/98 11:20 Date Received..: 05/06/98

PARAM RESULT	DUPLICATE RESULT	UNITS RP	RPD	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids 80.5	80.5	8	0.057		SD Lot-Sample #: MCAWW 160.3 MOD		8127137

Dilution Factor: 1

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

## General Chemistry

Client Lot #...: A8E060157

Work Order # ...: CHOOC-SMP

Matrix....: SOLID

CHOOC-DUP

Date Sampled...: 05/05/98 11:00 Date Received..: 05/06/98

% Moisture....:

.:	DUPLICATE RESULT			RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #	
_	RESOLL	- 01.110	RPD		SD Lot-Sample #:			
	91.1	8	0.24	(0-20)	MCAWW 160.3 MOD	05/07-05/08/98	8127139	

Dilution Factor: 1

NOTE (S):

PARAM RESULT Percent Solids

90.9

Calculations are performed before rounding to avoid round-off errors in calculated results.

## General Chemistry

Client Lot #...: A8E060157

Work Order #...: CH02L-SMP

Matrix....: SOLID

CH02L-D

Date Sampled...: 05/04/98 19:20 Date Received..: 05/06/98

Moisture....: 16

PADAM DECITE	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
PARAM RESULT Percent Solids	RESOLI	011210	1		SD Lot-Sample #:	A8E060157-028	
83.6	81.8	ક	2.2	(0-20)	MCAWW 160.3 MOD	05/07-05/08/98	8127139

Dilution Factor: 1

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

# Chain of stody Record



DUA-4149-1 Client	Project Manager					Date 5 GO			, , 1				
	John Hunter					Mry 4, 1998	P	age_	of _	_/			
3M Company	Telephone Number	(Area Code)/Fax N	lumber		La	b Location	1,	de	Analysi	s			
935 Bush Ave.	(612) 778-5388					Quantava - North Conton							
State State	Zip Code		Site Contact					- 2		19			
SI Paril MA	155144.	-1000	C	1RO1 51	yder				44	13			
Project Number/Name		1000	Carrier/Waybill Nur	nber	,			50.00	9	13			
CORDOVA RFI MAY!	998		Fede	x: 5	605	4	025 2	024	8080	1			
Contract/Purchase Order/Quote Number									100	17			
			2 1 2 4						-91	1			
- I Description	Date	Time	Sample Type		tainers		Preservative	Condition on Receipt/Comments	H	習			
Sample I.D. Number and Description	Date	Timo	Gampie Type	Volume	Туре	No.				11	+		
Field Blank 1	5/4/14	13:04	WATER	14ite1	Ander	2	None		-0	+-			
EQUIPMENT BLANK!	5/4/98	14:02			Amber	2	None	1111		Y			
1		-1		1250 ml	11	1	MOH	100		7			
V	V	V		40 ml	g/ASS_	3	HCI	19 19	V'	1			
REI-I (RES) MW5-70	5/4/98	1 8:39	1	14th	Amber	2	None		R	1			
RFI - I (TRES) MUS-90 HE/MED!		18:34	Dotor	1 Litra	Anter	2	your		X	1			
RFI - I (RIS) MH4-90	5 5 99	9:17	-			2			X				
RFI - I (RIS) MH1-94	5 9 98	12:14				2			X				
PFT - I (DE) MUZ-94	5 5 91	13:02				2			X				
PFT-I (PL) MU7-94	5 - 98	14:60				2			X				
EQUIPMENT BLANK #2	5/5/91	15:20				2			_X				
FISCO BLANK #2				V	-V	2	V						
FILLD DUPLICATE	5/4/99	18:30	1	40m	GLASS	3	Hel			X		+	
TRIP BLANK	0		1	10114	PLASTIC	1	Nobe	FOR TIMPCHATURE ONLY		-	-		
TEMP BLANK		1			CREEK								
Special Instructions		-			1		1						
MAIL CATHYLUSON 612- Possible Hazard Identification	551-2474	01	CAROL SI	14del L	U/QU	25	tions					and the same	
Possible Hazard Identification		_		Sample Disp	osal			П в	(A I	ee ma	ay be assessed if s longer than 3 mont	amples are hs)	
	kin Irritant	Poison	B Unkno	own Return	n To Client		Disposal By Lab		ns ion			-	
Turn Around Time Required			QC Level Ar P	ar Horkelen	Project	Speci	lic Requirements	(Specify)					
Normal Rush	Other	- +		II.   III.	1. Recei	lund Du			-	-	Date	Time	
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( VS tour			5/5/98	Time	2. Rece	ived By			-		Date	Time	
2. Relinquished By			Date	lime	2. 11000	vou by						8-	
V				Time	3. Rece	ived By	-				Date	Time	
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		•					Opn	Mo	-		10		
Commants	- 1	0391	30									4	
Custody Seals: 03912	-			W. FI-110									
DISTRIBUTION: WHITE - Stays with the Sample;	CANARY - Return	ed to Clie	nt with Report; Pli	чк - гівіа Сору									

# Chain of stody Record

Se-15: 03910 + 039115



DUA-4149-1			I more and the second				I Da	le .						
3M Co-pany - C	or dove	4			Hunt	01		May 5, 1798	Page _					
Address				(Area Code)/Fax N			La	Location	Analysis					
935 Bush Avenue			Telephone Number (Area Code)/Fax Number  6/2-778-5398  Quanterra- N. Canton						2	4				
City State 2	Tip Code		Site Contact				7		0 3	3				
St. Paul MN 55144-1000			Carol Snyder 5							8				
Project Number:Name			Carrier/Waybill Nur	nber	1	11	1 -	4 - 5	0000	44				
Cordova RFI - May 1998			Fad	Ex: 8	3005	-40	25 - 2	200	808	34				
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102801 / 10100									No co					
	Date	Time	Sample Type	Containers		Preservative	Condition on Receipt/Comments	AHO						
Sample I.D. Number and Description	Dale	Tille	Gumpio Typo	Volume	Туре	No.					++++			
Temperature Blank 55-5/5	5-5-98	-	water	-		-	- WALA		V	10-	- - - -			
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ц		0845	Water	1 9.401	Glass	3	None		YAV		17 193.			
Equipment Black 4		0900	water	1 P.t.	Plustic	1	HN93		TV X		200			
in a		0900	Water	1 R.t.	61-55	2	None		120	++++				
RFI-1 (RES) 55-25		0945	Soil	120 ml	61.55	3	None			1-1-1-				
RFI-1 (RES) 55-26		1020				-		,	13 13	1119	0			
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11 11		1340	Unter	1 Riter	610.55	5	Nane		- XX		1 3			
RF7-1(RES) SS-20		1355	Soil	120 1 1	61.55	3	None			<b></b>				
RFI- 1 (RES) SS-20 MS/MSD6		1355								5				
RFJ-1 (RES) 55-7		1440				11				+				
RFI-1 (RES) SS-7 MS/MSD7		1440				1			A S		++++			
RFT-1 (RES) 55-21	*	1545	V	V	V	V	V							
Special Instructions  (-11 C-thy L-150n 6  Possibly Hazard Identification				00	1	1 -	1.	w/anstians						
Call Cathy Larson 6	12-22	1-24	79	UK	C3/0	1 2	"y der	1801-3 CION 3	// /	. he accessed if	camples are			
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Turn Around Time Required	15/5		QC Level 30	Se Oakk	Tay Project	- Spacin	Top Southberr	(Specify) Work Plant	7	17 /QC	Lourle			
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1

QUA-4149-1		Desired Manager				Dat	le ·							
Client	Project Manager						Page of							
3M Compray	Telephone Number (Area Code)/Fax Number Lai					MAY 4, 1998			Avertuals					
Address	/ /				M	santerra-no-tra Const	Analysis							
935 Bush Ave.									IN	T				
St- PNI State Zip Co	CAR	CAROL Snydy							8/20					
Project Number/Name	Caralas Atlandalii Ale	Control Manual Manual Angelog								П				
COLDOVA RFI MAY 1998 Contract/Purchase Order/Ouole Number	Fid C	Fid Ex: 8005 - 4025 - 2002							due					
102801 / 10100	)	5/4						0	20	0				
	Tipo	Sample Type		ntainers	Preservative	Condition on Receipt/Comments	1x	49	H					
Sample 1.5. Humber and Decomposit	- dyo			Турв	No.				17	++	+	+		
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1	7/18/19		1 Liter	Anyes	a	none		1-13			+	1-1-		
BET-T (RES) 55-1	1 1001	Soil	120 ml	giass	3	None		17	<b>V</b>	++	++-	+		
RFI-I(RES) 55-28	5/4 1710		-					10	-10	++	+	1		
1 OCT - T 10657 55 - 22	1830	2			-			0	2	+	+	1		
VRFI-I (PES) 55-230	1750				15	1,1		1	71	++	++	-	1	
Field DiplicATE 5	1553	5			13	7		1/	10	++	+	1		
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5/5/20 1/15/	15 FA.			-	-			1	1				TI	
RF2-1 (RES) SS. 1 MS/MSD4	15/4				-			11						
6151	1-													
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	4-98 192		D 120 ml	61-55	1	-	B. Trao Massure	1		X				
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Possibly Hazard Identification	П	- Dut	П	n To Client		Disposal By Lab	Archive For Month	s reta	ined I	onger	than 3	months	5)	
Non-Hazard Flammable Skin Irrita	ant Poiso	n B Unkr	nown   rietori	Project		ic Requirements	(Specify)				1			
Tom your range require			] II.   III.		500									
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DISTRIBUTION: WHITE - Stays with the Sample; CANAR	Y - Returned to Cl	ent with Report; P	INK - Field Copy	.1.		. H <	) Per	11	100	E	W	0111	77.	- /4

# **CORDOVA RFI**

MAY 1998 ANALYTICAL REPORT

LOT #: A8E080133



Quanterra Incorporated 4101 Shuffel Drive, NW North Canton, Ohio 44720

330 497-9396 Telephone 330 497-0772 Fax

# ANALYTICAL REPORT

CORDOVA RFI MAY 1998

Lot #: A8E080133

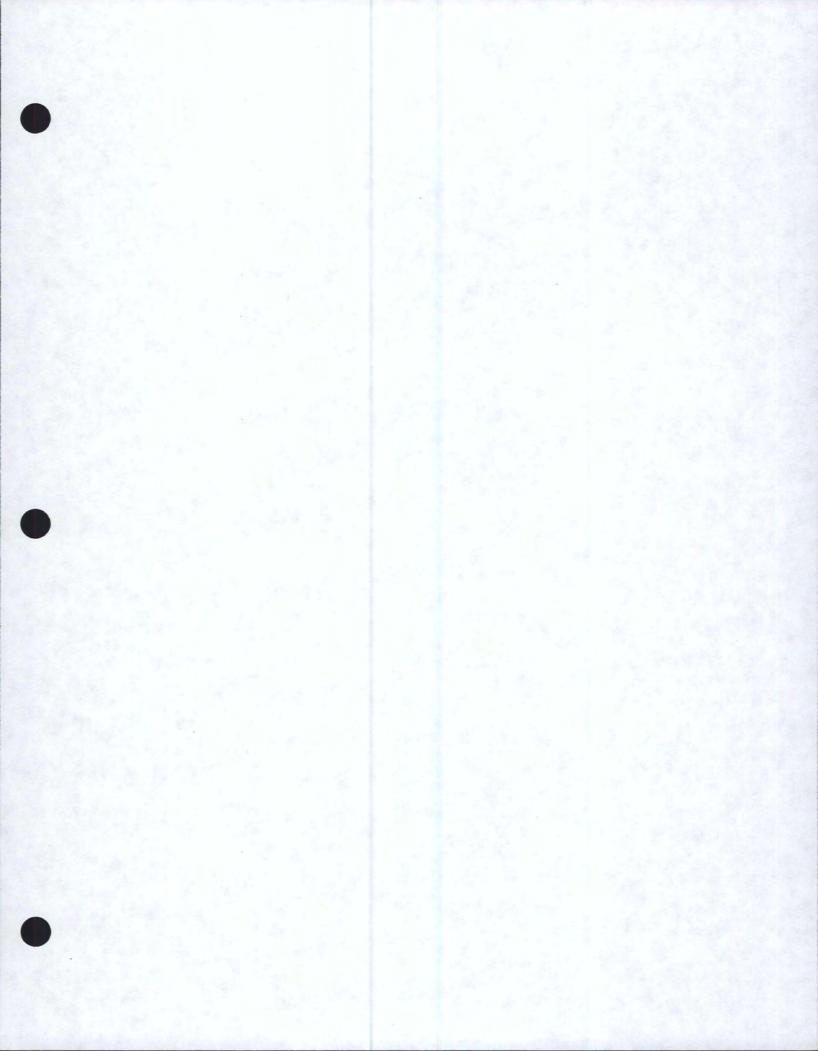
Carol Snyder

3M Company

QUANTERRA INCORPORATED

Jeffrey C. Smith Project Manager

June 15, 1998



# CASE NARRATIVE

The following report contains the analytical results for eight water samples and seven solid samples submitted to Quanterra-North Canton by 3M Company from the Cordova RFI May 1998 Site. The samples were received May 7, 1998 according to documented sample acceptance procedures.

Quanterra-North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided by facsimile transmission to Carol Snyder on June 4, 1998.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Samples submitted for Total and Amenable Cyanide were placed in archive per the chain-of-custody.

The coolers were received at the laboratory at temperatures of 1.6, 2.4 and 1.6° C.

# SUPPLEMENTAL QC INFORMATION

# GC SEMIVOLATILES - Organochlorine Pesticides

Samples RFI-I (RES) SS-4, Field Duplicate #7 and RFI-I (RES) SS-2 were diluted due to matrix effects and was ND; therefore, the detection limits were elevated.

# GC SEMIVOLATILES - Polychlorinated Biphenyls

Samples RFI-I (RES) SS-15, RFI-I (RES) SS-4, Field Duplicate #7, RFI-I (RES) SS-19, RFI-I (RES) SS-2, RFI-I (RES) SS-11 and RFI-I (RES) SS-10 were diluted due to matrix effects and was ND; therefore, the detection limits were elevated.

#### **METALS**

There is the possibility of false positive results when reporting down to the Method Detection Limit (MDL). The acceptance criteria for ICB, CCB, and Method Blank is + the RL.

# SAMPLE SUMMARY

#### A8E080133

WO #_	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CHITE	001	RFI-I (RES) MW2-90	05/07/98	
CHITE	002	RFI-I (RES) MW1-90	05/07/98 05/07/98	
CHITQ	003	RFI-I (RES) MW5-94	05/07/98	
CHITR	004	RFI-I (RES) MW6-94 FIELD BLANK #4	05/07/98	
CHITT	005	RFI-I (RES) MW3-90	05/07/98	
CHITW	007	RFI-I (RES) SS-15	05/07/98 05/07/98	
CHITX	. 008	RFI-I (RES) SS-4	05/07/98	
CH1V0	009	FIELD DUPLICATE #7 RFI-I (RES) SS-19	05/07/98	
CH1V3	011	RFI-I (RES) SS-2	05/07/98 05/07/98	
CH1V4	012	FIELD BLANK #10	05/07/98	
CH1V6	013 014	EQUIPMENT BLANK #5 RFI-I (RES) SS-11	05/07/98	14:10
CH1V8	014	RFI-I (RES) SS-10	05/07/98	15:30

#### NOTE (S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
  - esults noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# ANALYTICAL METHODS SUMMARY

#### A8E080133

PARAMETER	ANALYTICAL METHOD
Inductively Coupled Plasma (ICP) Metals	SW846 6010A
Organochlorine Pesticides	SW846 8081A
PCBs	SW846 8082
Total Residue as Percent Solids	MCAWW 160.3 MOD
Frace Inductively Coupled Plasma (ICP) M	Metals SW846 6010A
References:	
MCAWW "Methods for Chemical Analysis EPA-600/4-79-020, March 1983 a	

SW846

"Test Methods for Evaluating Solid Waste, Physical/Chemical

Methods", Third Edition, November 1986 and its updates.

## 3M COMPANY

# Client Sample ID: RFI-I (RES) MW2-90

# GC Semivolatiles

Lot-Sample #: A8E080133-001 Date Sampled: 05/07/98 09:40 Prep Date: 05/12/98 Prep Batch #: 8132112	Date Received: Analysis Date:	05/08/98 05/28/98	Matrix: WATER				
Dilution Factor: 1	Method:	: SW846 8081A					
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 0.050	UNITSug/L				
SURROGATE Tetrachloro-m-xylene	PERCENT RECOVERY 53	RECOVERY LIMITS (10 - 130)					

61

Decachlorobiphenyl

(10 - 116)

## Client Sample ID: RFI-I (RES) MW1-90

## GC Semivolatiles

Date Sampled: Prep Date:	05/07/98 10:59 05/12/98	Work Order #: Date Received: Analysis Date:	05/08/98	Matrix WA	ATER
Prep Batch #: Dilution Factor:		Method:		A ·	
PARAMETER		RESULT	REPORTING LIMIT	UNITS	
Hexachlorobenzen	e	ND	0.050	ug/L	
		PERCENT	RECOVERY		

RECOVERY LIMITS

49

64

(10 - 130) (10 - 116)

SURROGATE

Tetrachloro-m-xylene

Decachlorobiphenyl

# Client Sample ID: RFI-I (RES) MW5-94

## GC Semivolatiles

Lot-Sample #: A8E080133-003 Date Sampled: 05/07/98 12:44 Prep Date: 05/12/98 Prep Batch #: 8132112	Work Order #: Date Received: Analysis Date:	05/08/98	Matrix WATER
Dilution Factor: 1	Method:	SW846 8081	A
PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS	
Tetrachloro-m-xylene	41	(10 - 130)	

50

Decachlorobiphenyl

# Client Sample ID: RFI-I (RES) MW6-94

## GC Semivolatiles

Lot-Sample #: A8E080133-004 Date Sampled: 05/07/98 13:43 Prep Date: 05/12/98 Prep Batch #: 8132112	Work Order #: Date Received: Analysis Date:	05/08/98	Matrix: WATER
Dilution Factor: 1	Method:	SW846 80812	Α
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 0.050	UNITS ug/L
SURROGATE Tetrachloro-m-xylene	PERCENT RECOVERY	RECOVERY LIMITS (10 - 130)	
Decachlorobiphenyl	65	(10 - 116)	

## Client Sample ID: FIKLD BLANK #4

## GC Semivolatiles

Date Received:	05/08/98	Matrix: WATER
Method:	SW846 8081	A
RESULT ND	REPORTING LIMIT 0.050	UNITS ug/L
PERCENT RECOVERY 51	RECOVERY LIMITS (10 - 130)	
	PERCENT RECOVERY	RESULT LIMIT  ND 0.050  PERCENT RECOVERY  RECOVERY LIMITS

Decachlorobiphenyl

## Client Sample ID: RFI-I (RES) MW3-90

## GC Semivolatiles

Lot-Sample #: A8E080133-006 Date Sampled: 05/07/98 15:52 Prep Date: 05/12/98 Prep Batch #: 8132112	Work Order #: Date Received: Analysis Date:	05/08/98	Matrix: WATER
Dilution Factor: 1	Method:	SW846 8081A	
PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L
SURROGATE	PERCENT	RECOVERY LIMITS	
Tetrachloro-m-xylene	57	(10 - 130)	
Decachlorobiphenyl	49	(10 - 116)	

# Client Sample ID: RFI-I (RES) SS-15

## GC Semivolatiles

Date Sampled: 05/07 Prep Date: 05/14		05/08/98	Matrix SOLID
Prep Batch #: 81341	37		
Dilution Factor: 20			
% Moisture: 14	Method	SW846 8082	

PARAMETER	RESULT	LIMIT	UNITS
Aroclor 1016	ND	760	ug/kg
Aroclor 1221	ND	760	ug/kg
Aroclor 1232	ND	760	ug/kg
Aroclor 1242	ND	760	ug/kg
Aroclor 1248	ND	760	ug/kg
Aroclor 1254	ND	760	ug/kg
Aroclor 1260	ND	760	ug/kg
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	_
Tetrachloro-m-xylene	109 DIL	(8.0- 12	9)
Decachlorobiphenyl	346 DIL,*	(0.0- 13	8)

#### MOTE(S)

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

Client Sample ID: RFI-I (RES) SS-15

#### TOTAL Metals

Matrix..... SOLID Lot-Sample #...: A8E080133-007

Date Sampled...: 05/07/98 08:45 Date Received..: 05/08/98

% Moisture....: 14

PREPARATION- WORK REPORTING ANALYSIS DATE ORDER #

METHOD LIMIT UNITS PARAMETER RESULT

Prep Batch #...: 8141113

05/21-05/29/98 CH1TW102 SW846 6010A 5790 ug/kg 180000 Cobalt

Dilution Factor: 1

NOTE (S): Results and reporting limits have been adjusted for dry weight.

# Client Sample ID: RFI-I (RES) SS-4

### GC Semivolatiles

Lot-Sample #: A8E080133-008 Date Sampled: 05/07/98 09:15 Prep Date: 05/12/98 Prep Batch #: 8132107	Work Order #: Date Received: Analysis Date:	05/08/98	Matrix: SOLID
Dilution Factor: 20 % Moisture: 17	Method:	SW846 8081A	
PARAMETER Hexachlorobenzene	RESULT ND	2021100	NITS
SURROGATE Tetrachloro-m-xylene Decachlorobiphenyl	PERCENT RECOVERY 0.0 DIL,*	RECOVERY LIMITS (8.0- 129) (0.0- 138)	

### NOTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

## Client Sample ID: RFI-I (RES) SS-4

#### GC Semivolatiles

Lot-Sample #: A8E080	133-008 Work Order #:	CH1TX102	Matrix: SOLID
Date Sampled: 05/07/	98 09:15 Date Received:	05/08/98	
Prep Date: 05/12/	98 Analysis Date:	06/02/98	
Prep Batch #: 813210	8		
Dilution Factor: 20			Lake to the control of the control o
* Moisture: 17	Method	SW846 8082	
		REPORTING	
PARAMETER	RESULT	LIMIT	UNITS
Aroclor 1016	ND	800	ug/kg
Aroclor 1221	ND	800	ug/kg
Aroclor 1232	ND	800	ug/kg
Aroclor 1242	ND	800	ug/kg
Aroclor 1248	ND	800	ug/kg
Aroclor 1254	ND	800	ug/kg
Aroclor 1260	ND	800	ug/kg
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	

107 DIL 169 DIL,\* (8.0- 129)

(0.0 - 138)

## OTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Tetrachloro-m-xylene

Decachlorobiphenyl

Results and reporting limits have been adjusted for dry weight.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

## Client Sample ID: FIELD DUPLICATE #7

### GC Semivolatiles

Lot-Sample #: A8E080133-009 Date Sampled: 05/07/98 09:2 Prep Date: 05/12/98 Prep Batch #: 8132107	9 Work Order #: 15 Date Received: Analysis Date:	05/08/98	Matrix: SOLID
Dilution Factor: 20 % Moisture: 14	Method:	SW846 8081	A
PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	76	ug/kg
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS	epolitic at 15 feb
Tetrachloro-m-xylene	0.0 DIL,*	(8.0 - 129)	

0.0 DIL

(0.0 - 138)

### NOTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Decachlorobiphenyl

Results and reporting limits have been adjusted for dry weight.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

## Client Sample ID: FIELD DUPLICATE #7

#### GC Semivolatiles

Lot-Sample #: A8E080133-009 Work Order #: CH1V0103 Matrix SO	Tot-Sample #:	A8E080133-009	Work Order #:	CH1V0103	Matrix: SO	LID
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Date Sampled...: 05/07/98 09:15 Date Received..: 05/08/98 Prep Date....: 05/12/98 Analysis Date..: 06/02/98

Prep Batch #...: 8132108

Dilution Factor: 20

% Moisture....: 14 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	760	ug/kg
Aroclor 1221	ND	760	ug/kg
Aroclor 1232	ND	760	ug/kg
Aroclor 1242	ND	760	ug/kg
Aroclor 1248	ND	760	ug/kg
Aroclor 1254	ND	760	ug/kg
Aroclor 1260	ND	760	ug/kg
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	
Tetrachloro-m-xylene	100 DIL	(8.0- 129)	
Decachlorobiphenyl	190 DIL,*	(0.0- 138)	

#### NOTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

# Client Sample ID: RFI-I (RES) SS-19

#### GC Semivolatiles

Tot-Sample #: A8E080133-010 Work Order #: CH1V2103 Matrix: SOL.	Tot-Sample #	: A8E080133-010	Work Order #: CH1V2103	Matrix SOL
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Date Sampled...: 05/07/98 11:00 Date Received..: 05/08/98 Prep Date....: 05/14/98 Analysis Date..: 06/02/98

Prep Batch #...: 8134157

Dilution Factor: 20

% Moisture....: 15 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	780	ug/kg
Aroclor 1221	ND	780	ug/kg
Aroclor 1232	ND	780	ug/kg
Aroclor 1242	ND	780	ug/kg
Aroclor 1248	ND	780	ug/kg
Aroclor 1254	ND	780	ug/kg
Aroclor 1260	ND	780	ug/kg
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	_
Tetrachloro-m-xylene	98 DIL	(8.0- 129)	
Decachlorobiphenyl	153 DIL,*	(0.0- 138)	

#### TE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

# Client Sample ID: RFI-I (RES) SS-19

#### TOTAL Metals

Matrix....: SOLID Lot-Sample #...: A8E080133-010

Date Sampled...: 05/07/98 11:00 Date Received..: 05/08/98

% Moisture....: 15

NOTE (S):

PREPARATION-WORK REPORTING ANALYSIS DATE ORDER #

LIMIT UNITS METHOD PARAMETER RESULT

Prep Batch #...: 8141113

05/21-05/29/98 CH1V2102 SW846 6010A ug/kg 5890 Cobalt 87400

Dilution Factor: 1

Results and reporting limits have been adjusted for dry weight.

# Client Sample ID: RFI-I (RES) SS-2

## GC Semivolatiles

Lot-Sample #: A8E080133-011 Date Sampled: 05/07/98 11:30 Prep Date: 05/12/98	Work Order #: Date Received: Analysis Date:	05/08/98	Matrix SOLID
Prep Batch #: 8132107 Dilution Factor: 20 % Moisture: 17	Method:	SW846 8081	A
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 79	UNITS ug/kg
SURROGATE	PERCENT RECOVERY 0.0 DIL,*	RECOVERY LIMITS (8.0- 129)	
Tetrachloro-m-xylene Decachlorobiphenyl	0.0 DIL	(0.0- 138)	

#### NOTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

## Client Sample ID: RFI-I (RES) SS-2

#### GC Semivolatiles

Lot-Sample #...: A8E080133-011 Work Order #...: CH1V3102 Matrix.....: SOLID

Date Sampled...: 05/07/98 11:30 Date Received..: 05/08/98 Prep Date....: 05/12/98 Analysis Date..: 06/02/98

Prep Batch # ...: 8132108

Dilution Factor: 20

% Moisture....: 17 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING	UNITS
Aroclor 1016	ND	790	ug/kg
Aroclor 1221	ND	790	ug/kg
Aroclor 1232	ND	790	ug/kg
Aroclor 1242	ND	790	ug/kg
Aroclor 1248	ND	790	ug/kg
Aroclor 1254	ND	790	ug/kg
Aroclor 1260	ND	790	ug/kg
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	
Tetrachloro-m-xylene	126 DIL	(8.0- 129	9)
Decachlorobiphenyl	211 DIL,*	(0.0- 138	3)

#### MOTE (S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

# Client Sample ID: FIKLD BLANK #10

## GC Semivolatiles

Lot-Sample #: A8E080133-012 Date Sampled: 05/07/98 13:20 Prep Date: 05/12/98 Prep Batch #: 8132112	Work Order #: Date Received: Analysis Date:	05/08/98	Matrix: WATER
Dilution Factor: 1	Method:	SW846 8081	A
PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS	
Tetrachloro-m-xylene Decachlorobiphenyl	70 114	(10 - 130) (10 - 116)	

## Client Sample ID: FIKLD BLANK #10

### GC Semivolatiles

Lot-Sample #: A8E080133-012	Work Order #: CH1V410	2 Matrix WATER
Lot-Sample #: AsEUSUI33-UI2	MOTY OTGET # CHITAIT	

Date Sampled...: 05/07/98 13:20 Date Received..: 05/08/98 Prep Date....: 05/13/98 Analysis Date..: 05/22/98

Prep Batch #...: 8133104

Dilution Factor: 1 Method....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS	
Aroclor 1016	ND	1.0	ug/L	
Aroclor 1221	ND	1.0	ug/L	
Aroclor 1232	ND	1.0	ug/L	
Aroclor 1242	ND	1.0	ug/L	
Aroclor 1248	ND	1.0	ug/L	
Aroclor 1254	ND	1.0	ug/L	
Aroclor 1260	ND	1.0	ug/L	
	PERCENT	RECOVERY		
SURROGATE	RECOVERY	LIMITS	<u></u>	
Tetrachloro-m-xylene	86	(10 - 130	)	
Decachlorobiphenyl	74	(10 - 116	5)	

# Client Sample ID: FIELD BLANK #10

## TOTAL Metals

Lot-Sample # Date Sampled	.: A8E080133 .: 05/07/98	-012 13:20 Date R	eceived	: 05/08/98	Matrix:	WATER
PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch # Cobalt	ND	7.0 ilution Factor: 1	ug/L	SW846 6010A	05/13-05/18/98	CH1V4101

## Client Sample ID: EQUIPMENT BLANK #5

## GC Semivolatiles

Lot-Sample #: A8E080133-013 Date Sampled: 05/07/98 13:45 Prep Date: 05/12/98 Prep Batch #: 8132112	Work Order #: Date Received: Analysis Date:	05/08/98	Matrix: WATER
Dilution Factor: 1	Method:	SW846 8081	Α .
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 0.050	UNITS ug/L
SURROGATE Tetrachloro-m-xylene	PERCENT RECOVERY 84	RECOVERY LIMITS (10 - 130)	

78

Decachlorobiphenyl

# Client Sample ID: EQUIPMENT BLANK #5

### GC Semivolatiles

Lot-Sample #: A8E080133-013 Work Order #: CH1V6102 Matrix WATE	Lot-Sample #:	A8E080133-013	Work Order #	: CH1V6102	Matrix:	WATER
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Date Sampled...: 05/07/98 13:45 Date Received..: 05/08/98 Prep Date....: 05/13/98 Analysis Date..: 05/22/98

Prep Batch #...: 8133104

Dilution Factor: 1 Method....: SW846 8082

		REPORTING	
PARAMETER	RESULT	LIMIT	UNITS
Aroclor 1016	ND	1.0	ug/L
Aroclor 1221	ND	1.0	ug/L
Aroclor 1232	ND	1.0	ug/L
Aroclor 1242	ND	1.0	ug/L
Aroclor 1248	ND	1.0	ug/L
Aroclor 1254	ND	1.0	ug/L
Aroclor 1260	ND	1.0	ug/L
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	_
Tetrachloro-m-xylene	67	(10 - 130	))
Decachlorobiphenyl	30	(10 - 116	5)

## Client Sample ID: EQUIPMENT BLANK #5

## TOTAL Metals

Lot-Sample # Date Sampled	: A8E080133	-013 13:45 Date R	eceived	: 05/08/98	Matrix:	WATER
PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch # Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CH1V6101

Dilution Factor: 1

# Client Sample ID: RFI-I (RES) SS-11

## GC Semivolatiles

Lot-Sample #: Date Sampled: Prep Date: Prep Batch #:	05/07/98 14:10 05/14/98	Work Order #: Date Received: Analysis Date:	05/08/98	Matrix SOLID
Dilution Factor: % Moisture:		Method:	SW846 8082	
			REPORTING	
PARAMETER		RESULT	LIMIT	UNITS
Aroclor 1016		ND	760	ug/kg
Aroclor 1221		ND	760	ug/kg
Aroclor 1232		ND	760	ug/kg
Aroclor 1242		ND	760	ug/kg
Aroclor 1248		ND	760	ug/kg
Aroclor 1254		ND	760	ug/kg
Aroclor 1260		ND	760	ug/kg
		PERCENT	RECOVERY	
SURROGATE		RECOVERY	LIMITS	
Tetrachloro-m-xy	lene	133 DIL,*	(8.0- 129)	
Decachlorobiphen		228 DIL,*	(0.0- 138)	

### OTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

Client Sample ID: RFI-I (RES) SS-11

#### TOTAL Metals

Lot-Sample #...: A8E080133-014 Matrix....: SOLID

Date Sampled...: 05/07/98 14:10 Date Received..: 05/08/98

\* Moisture....: 13

PARAMETER RESULT LIMIT UNITS METHOD PREPARATION- WORK

ANALYSIS DATE ORDER #

Prep Batch #...: 8141113

Cobalt 120000 5780 ug/kg SW846 6010A 05/21-05/29/98 CH1V8102

Dilution Factor: 1

NOTE (S):

Results and reporting limits have been adjusted for dry weight.

## Client Sample ID: RFI-I (RES) SS-10

### GC Semivolatiles

Tat Camala #	. 300000133-015	Work Order #: CH1V9103	Matrix SOLID
Tak Cample #	• A8E080133-015	MOLK OLDER #*** CHTANATOR	

Date Sampled...: 05/07/98 15:30 Date Received..: 05/08/98 Prep Date....: 05/14/98 Analysis Date..: 06/02/98

Prep Batch #...: 8134157

Dilution Factor: 20

% Moisture....: 16 Method....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS	
Aroclor 1016	ND	780	ug/kg	
Aroclor 1221	ND	780	ug/kg	
Aroclor 1232	ND	780	ug/kg	
Aroclor 1242	ND	780	ug/kg	
Aroclor 1248	ND	780	ug/kg	
Aroclor 1254	ND	780	ug/kg	
Aroclor 1260	ND	780	ug/kg	
	PERCENT RECOVERY	RECOVERY		
SURROGATE		(8.0- 129	7	
Tetrachloro-m-xylene	105 DIL			
Decachlorobiphenyl	188 DIL,*	(0.0- 138	1	

#### OTR (S)

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

Client Sample ID: RFI-I (RES) SS-10

#### TOTAL Metals

Matrix....: SOLID Lot-Sample #...: A8E080133-015

Date Sampled...: 05/07/98 15:30 Date Received..: 05/08/98

\* Moisture ....: 16

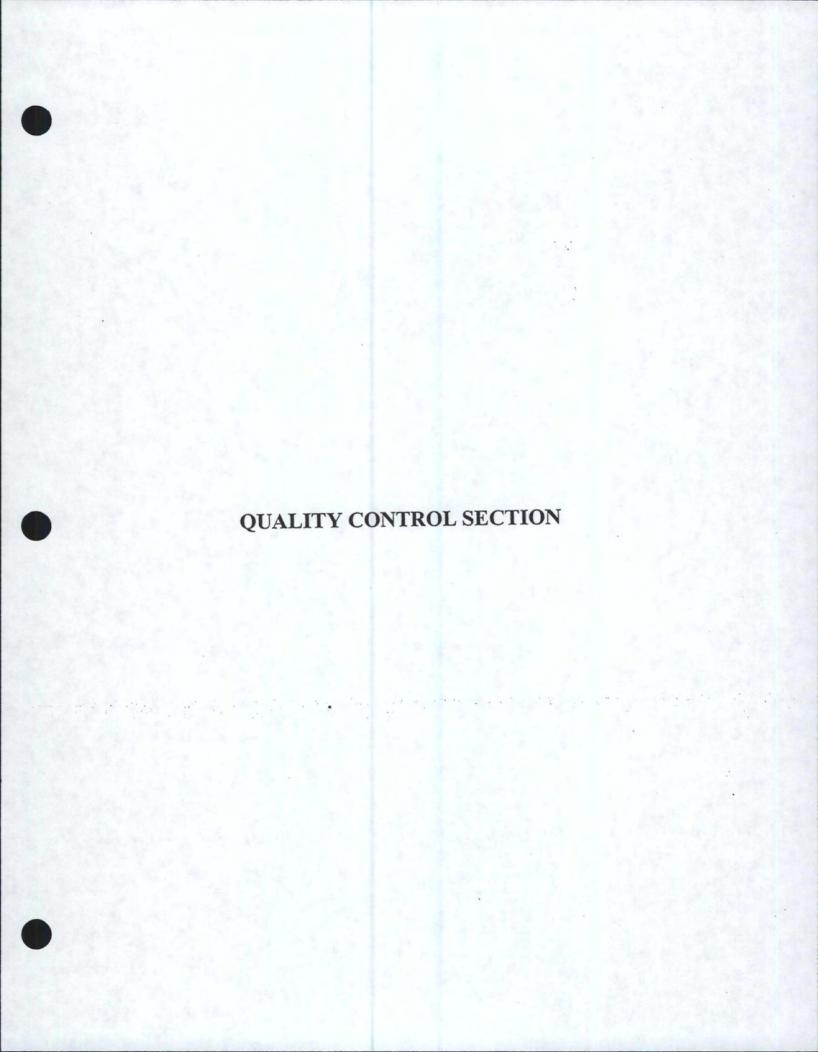
WORK PREPARATION-REPORTING ANALYSIS DATE ORDER # METHOD LIMIT UNITS RESULT PARAMETER

Prep Batch # ...: 8141113 05/21-05/29/98 CH1V9102 SW846 6010A ug/kg 5950 109000 Cobalt

Dilution Factor: 1

NOTE (S):

Results and reporting limits have been adjusted for dry weight.



# QUALITY CONTROL ELEMENTS OF SW-846 METHODS

Quanterra® Incorporated conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

OC BATCH

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. Quanterra requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. Failure to meet the established recovery guidelines requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). Failure of the RPDs to fall within the laboratory-generated acceptance windows requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the MS/MSD RPDs are within acceptance criteria, the batch is acceptable.

METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except for the common laboratory contaminants indicated below.

Volatile (GC or GC/MS)	Semivolatile (GC/MS)	Metals
Methylene chloride Acetone 2-Butanone	Phthalate Esters	Copper Iron Zinc Lead*

<sup>\*</sup> for analyses run on TJA Trace ICP or GFAA only

# QUALITY CONTROL ELEMENTS OF SW-846 METHODS (continued)

METHOD BLANK (continued)

The listed volatile and semivolatile compounds may be present in concentrations up to 5 times the reporting limits. The listed metals may be present in concentrations up to 2 times the reporting limit or must be twenty fold less than the results of the environmental samples. Failure to meet these Method Blank criteria requires the repreparation and reanalysis of all samples in the QC batch.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. When these values fail to meet acceptance criteria, the data is reviewed to determine the cause. If, in the analyst's judgment, sample matrix effects are indicated, no corrective action is performed. Otherwise, the MS/MSD and the environmental sample used to prepare them are reprepared and reanalyzed.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch.

SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample are spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

The acceptance criteria do not apply to samples that are diluted. If the dilution is more than 5X, the recoveries will be reported as diluted out. All other surrogate recoveries will be reported. If the LCS, LCSD, or the Method Blank surrogates fail to meet recovery criteria (exception for dilutions), the entire batch of samples is reprepared and reanalyzed.

If the surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank and the associated sample(s) are ND, the batch is acceptable. If the surrogate recoveries are outside criteria for environmental or MS/MSD samples, the batch may be acceptable based on the analyst's judgment that sample matrix effects are indicated.

For the GC/MS BNA methods, the surrogate criteria is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide/PCB, PAH, TPH, and Herbicide methods, the surrogate criteria is that one of two surrogate compounds meet acceptance criteria.

#### GC Semivolatiles

Client Lot #...: A8E080133 Work Order #...: CH3NN102 Matrix....: WATER

LCS Lot-Sample#: A8E120000-112

Prep Date....: 05/12/98 Analysis Date..: 05/29/98

Prep Batch #...: 8132112

Dilution Factor: 1

PARAMETER	PERCENT	RECOVERY LIMITS	METHOD
Lindane	76	(63 - 122)	SW846 8081A
Heptachlor	74	(56 - 125)	SW846 8081A
Aldrin	69	(60 - 117)	SW846 8081A
Dieldrin	83	(63 - 122)	SW846 8081A
Endrin	79	(48 - 129)	SW846 8081A
4,4'-DDT	87	(55 - 128)	SW846 8081A
		PERCENT	RECOVERY
SURROGATE	,	RECOVERY	LIMITS
Tetrachloro-m-xylene		56	(10 - 130)
Decachlorobiphenyl		20	(10 - 116)

NOTE (S):

culations are performed before rounding to avoid round-off errors in calculated results.

ld print denotes control parameters

#### GC Semivolatiles

Client Lot #...: A8E080133 Work Order #...: CH3NF102 Matrix....: SOLID

LCS Lot-Sample#: A8E120000-107

Prep Date....: 05/12/98 Analysis Date..: 05/30/98

Prep Batch #...: 8132107

Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Lindane	59	(52 - 108)	SW846 8081A
Heptachlor	58	(53 - 130)	SW846 8081A
Aldrin	49	(43 - 116)	SW846 8081A
Dieldrin	62	(62 - 107)	SW846 8081A
Endrin	66	(64 - 127)	SW846 8081A
4,4'-DDT	74	(52 - 128)	SW846 8081A
		PERCENT	RECOVERY
SURROGATE		RECOVERY	LIMITS
Tetrachloro-m-xylene		68	(8.0- 129)
Decachlorobiphenyl		64	(0.0- 138)

NOTE (S) :

culations are performed before rounding to avoid round-off errors in calculated results.

sold print denotes control parameters

#### GC Semivolatiles

Client Lot #...: A8E080133 Work Order #...: CH5JF102 Matrix....: SOLID

LCS Lot-Sample#: A8E140000-157

Prep Date....: 05/14/98 Analysis Date..: 05/29/98

Prep Batch # ...: 8134157

Dilution Factor: 2

 PERCENT
 RECOVERY

 PARAMETER
 RECOVERY
 LIMITS
 METHOD

 Aroclor 1016
 95
 (60 - 133)
 SW846 8082

 Aroclor 1260
 100
 (59 - 129)
 SW846 8082

PERCENT RECOVERY
SURROGATE RECOVERY LIMITS

 SURROGATE
 RESOURCE

 Tetrachloro-m-xylene
 98
 (8.0- 129)

 Decachlorobiphenyl
 106
 (0.0- 138)

NOTE (S):

## GC Semivolatiles

Client Lot #...: A8E080133 Work Order #...: CH3NG102 Matrix.....: SOLID

LCS Lot-Sample#: A8E120000-108

Prep Date....: 05/12/98 Analysis Date..: 05/27/98

Prep Batch #...: 8132108

Dilution Factor: 2

 PERCENT
 RECOVERY

 PARAMETER
 RECOVERY
 LIMITS
 METHOD

 Aroclor 1016
 93
 (60 - 133)
 SW846 8082

 Aroclor 1260
 100
 (59 - 129)
 SW846 8082

 SURROGATE
 RECOVERY
 LIMITS

 Tetrachloro-m-xylene
 98
 (8.0- 129)

 Decachlorobiphenyl
 115
 (0.0- 138)

NOTE (S):

### GC Semivolatiles

Client Lot #...: A8E080133 Work Order #...: CH4JG102-LCS Matrix..... WATER

LCS Lot-Sample#: A8E130000-104 CH4JG103-LCSD

Prep Date....: 05/13/98 Analysis Date..: 05/22/98

Prep Batch #...: 8133104

Dilution Factor: 2

DADAMETER	PERCENT RECOVERY	RECOVERY	RPD LIM	
PARAMETER Aroclor 1016	91	(66 - 111)		SW846 8082
AFOCIOI 1016	88	(66 - 111)	2.4 (0-	23) SW846 8082
3-calor 1260	93	(65 - 111)		SW846 8082
Aroclor 1260	92	(65 - 111)	1.1 (0-	23) SW846 8082
		PERCENT	RECOVERY	
SURROGATE		RECOVERY	LIMITS	
Tetrachloro-m-xylene		96	(10 - 130	)
1001402010 1.7		93	(10 - 130	)
Decachlorobiphenyl		92	(10 - 116	
Decaciiior on ibiicii) i		90	(10 - 116	1

NOTE (S):

#### TOTAL Metals

Client Lot # ...: A8E080133

Matrix..... WATER

PREPARATION-

PERCENT RECOVERY

ANALYSIS DATE WORK ORDER # LIMITS METHOD RECOVERY

LCS Lot-Sample#: A8E120000-253 Prep Batch #...: 8132253

(83 - 107) SW846 6010A 05/13-05/18/98 CH4EA103 96 Cobalt

Dilution Factor: 1

NOTE (S):

PARAMETER

#### TOTAL Metals

Client Lot # ...: A8E080133

Matrix....: SOLID

PERCENT

RECOVERY

PREPARATION-

PARAMETER

RECOVERY

LIMITS METHOD

ANALYSIS DATE WORK ORDER #

LCS Lot-Sample#: A8E210000-113 Prep Batch #...: 8141113

90

(80 - 104) SW846 6010A 05/21-05/29/98 CHC3F11H

Dilution Factor: 1

NOTE (S):

Cobalt

#### METHOD BLANK REPORT

### GC Semivolatiles

Client Lot # ...: A8E080133

Work Order #...: CH3NN101

Matrix..... WATER

MB Lot-Sample #: A8E120000-112

Prep Date....: 05/12/98

Analysis Date..: 05/29/98

Prep Batch #...: 8132112

Dilution Factor: 1

Tetrachloro-m-xylene

Decachlorobiphenyl

REPORTING

PARAMETER RESULT LIMIT UNITS METHOD
Hexachlorobenzene ND 0.050 ug/L SW846 8081A

 PERCENT
 RECOVERY

 RECOVERY
 LIMITS

 52
 (10 - 130)

 58
 (10 - 116)

NOTE (S):

SURROGATE

#### GC Semivolatiles

Client Lot #...: A8E080133

Work Order # ...: CH3NF101

Matrix..... SOLID

MB Lot-Sample #: A8E120000-107

Prep Date....: 05/12/98

Analysis Date..: 06/03/98

Prep Batch #...: 8132107

Dilution Factor: 1

REPORTING

	RESULT	LIMIT	UNITS	METHOD	
PARAMETER Hexachlorobenzene	ND	3.3	ug/kg	SW846 8081A	

 SURROGATE
 RECOVERY
 LIMITS

 Tetrachloro-m-xylene
 98
 (8.0- 129)

 Decachlorobiphenyl
 188 \*
 (0.0- 138)

NOTE(S):

<sup>\*</sup> Surrogate recovery is outside stated control limits.

#### GC Semivolatiles

Client Lot # ...: A8E080133

Work Order #...: CH5JF101

Matrix....: SOLID

MB Lot-Sample #: A8E140000-157

Prep Date....: 05/14/98

Prep Batch #...: 8134157

Analysis Date..: 05/28/98 Dilution Factor: 1

REPORTING METHOD UNITS LIMIT RESULT PARAMETER SW846 8082 ug/kg 33 ND Aroclor 1016 SW846 8082 ug/kg 33 ND Aroclor 1221 SW846 8082 ug/kg 33 ND Aroclor 1232 SW846 8082 ug/kg 33 ND Aroclor 1242 SW846 8082 ug/kg 33 ND Aroclor 1248 SW846 8082 ug/kg 33 ND Aroclor 1254 SW846 8082 33 ug/kg ND Aroclor 1260

 SURROGATE
 RECOVERY
 LIMITS

 Tetrachloro-m-xylene
 90
 (8.0-129)

 Decachlorobiphenyl
 100
 (0.0-138)

TE (S):

culations are performed before rounding to avoid round-off errors in calculated results.

#### GC Semivolatiles

Client Lot #...: A8E080133

Work Order #...: CH3NG101

Matrix..... SOLID

MB Lot-Sample #: A8E120000-108

Prep Date....: 05/12/98

Analysis Date..: 05/27/98

Prep Batch #...: 8132108

Dilution Factor: 1

PARAMETER

Aroclor 1016

Aroclor 1221

Aroclor 1232

Aroclor 1242

Aroclor 1248

Aroclor 1254

Aroclor 1260

LIMIT METHOD UNITS RESULT ug/kg SW846 8082 33 ND SW846 8082 ug/kg 33 ND SW846 8082 ug/kg 33 ND SW846 8082 ug/kg 33 ND SW846 8082 33 ug/kg ND SW846 8082 ug/kg 33 ND SW846 8082 ug/kg 33 ND

REPORTING

 SURROGATE
 RECOVERY

 Tetrachloro-m-xylene
 82
 (8.0- 129)

 Decachlorobiphenyl
 93
 (0.0- 138)

TE (S) :

#### GC Semivolatiles

Client Lot #...: A8E080133

Work Order #...: CH4JG101

Matrix....: WATER

MB Lot-Sample #: A8E130000-104

Prep Date....: 05/13/98

Analysis Date ..: 05/22/98

Prep Batch # ...: 8133104

Dilution Factor: 1

REPORTING METHOD UNITS RESULT LIMIT PARAMETER SW846 8082 ug/L 1.0 ND Aroclor 1016 SW846 8082 ug/L 1.0 ND Aroclor 1221 SW846 8082 ug/L 1.0 ND Aroclor 1232 SW846 8082 ug/L 1.0 ND Aroclor 1242 SW846 8082 1.0 ug/L ND Aroclor 1248 SW846 8082 1.0 ug/L ND Aroclor 1254 SW846 8082 ug/L 1.0 ND Aroclor 1260 RECOVERY PERCENT LIMITS RECOVERY SURROGATE (10 - 130)Tetrachloro-m-xylene 82 (10 - 116)79 Decachlorobiphenyl

TOTE (S):

#### TOTAL Metals

Client Lot # ...: A8E080133

Matrix..... WATER

REPORTING

PREPARATION- WORK

PARAMETER RESULT LIMIT UNITS METHOD

ANALYSIS DATE ORDER #

MB Lot-Sample #: A8E120000-253 Prep Batch #...: 8132253

Cobalt

ND

7.0 ug/L

SW846 6010A 05/13-05/18/98 CH4EA101

Dilution Factor: 1

NOTE (S):

TOTAL Metals

Client Lot # ...: A8E080133

Matrix....: SOLID

PREPARATION- WORK REPORTING ANALYSIS DATE ORDER # PARAMETER RESULT LIMIT UNITS METHOD

MB Lot-Sample #: A8E210000-113 Prep Batch #...: 8141113

05/21-05/29/98 CHC3F10Q ug/kg SW846 6010A 5000 ND Cobalt

Dilution Factor: 1

NOTE (S):

### MATRIX SPIKE SAMPLE EVALUATION REPORT

#### TOTAL Metals

Matrix..... WATER Client Lot #...: A8E080133

Date Sampled...: 05/05/98 08:45 Date Received..: 05/06/98

PREPARATION- WORK PERCENT RECOVERY RPD ANALYSIS DATE ORDER # PARAMETER RECOVERY LIMITS RPD LIMITS METHOD

MS Lot-Sample #: A8E060157-012 Prep Batch #...: 8132253

05/13-05/18/98 CGXXT106 (80 - 120) SW846 6010A 97 05/13-05/18/98 CGXXT107 (80 - 120) 0.96 (0-20) SW846 6010A 96

Dilution Factor: 1

NOTE (S):

### MATRIX SPIKE SAMPLE EVALUATION REPORT

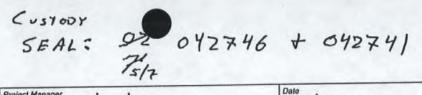
#### TOTAL Metals

Matrix....: SOLID Client Lot # ...: A8E080133 Date Sampled...: 05/14/98 11:10 Date Received..: 05/16/98 PREPARATION-RECOVERY RPD PERCENT ANALYSIS DATE ORDER # RECOVERY LIMITS RPD LIMITS METHOD PARAMETER MS Lot-Sample #: A8E160133-013 Prep Batch #...: 8141113 05/21-05/29/98 CH84E12D SW846 6010A (80 - 120)89 Cobalt 05/21-05/29/98 CH84E12E (80 - 120) 1.9 (0-20) SW846 6010A 87 Dilution Factor: 1

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

## Chain of stody Record



Not 2 Golos For 1 COC

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RFI-I (RIS) MD2-90	5/7/79	9:40	LINTER	1 Liter	Amber	2	None		X		
K-T-T (K12) LIDT- 10	31111	L	1	250 ml	PLASTIC	1	Not	Hold	X		
	7-1	10:59		ILiter	Amer	2	NONE		X		
RFI-I (7.15) MUI-90	5778	10.69			Plastic	1	NaOH	tola	X		
	4	*		250m	1 N	1		Tiple	V		
RFI-I (RES) MUS-94	5/7/19	17:44		ILiter	Amber	2	Nons	110	1		1111
7	1	1		750ml	Plantic	-	Not	Hold	X		
RFT-I (REG) MW6-94	51798	11:43		1 LITEL	Anby	2	NONE		1		++++-
l.	1	1	u file	250ml	Plachi	1	NaOH	Hold	1,1		
Field Blank #4	5/7/48	13:59		LITTER	Anter	2	None		X		
	3/1/41	1		250ml	Phohi	1	NaOH	Hold	X		
RFS	-1-1-2	*		14ten	Anby	7	NONE		X.		
RFI-I (1215) MH3-90	5/7/97	15:52	-	250 ml	Plactic	1	NaOH	Hold	IX		
-	111-5	*		23414	Plati	1	NONE	FOR TEMP MEASUREHOW	- 00	U	
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Special Instructions											
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## Chain of stody Record

Seals: 0427 + 042761



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REJ- (RES) 55-15  REJ- (RES) 55-15  REJ- (RES) 55-15  REJ- (RES) 55-16  REJ- (RES) 55-19  REJ- (RES) 55-10  REJ- (RES) 55-19  REJ- (REJ) 55-19  REJ- (RES) 5	1 To agest us RID-18 SS.5/	5-7-98	-	Water			)	None			V	-			1-1-1	-
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Special Instructions	V. Field Blank 5.2010	1320	1320	Maker	1 Riter		1				X					
RFI-1(RES) SS-1    14/0 Soil   120 ml   Gloss   3 No.12   18 No.12   18 No.14   18 Normal   Rush   Other   St. 748   17/15   18 Normal   Received By   St. 14 No. 18 Normal   Rush   Other   St. 748   17/15   St. 16 No. 18 No.	-> Equipment Blocks/7-8	213/3	4010				1				X	X				
RFI-1(RFS) SS-11  /RFI-1(RFS) SS-10  /Relimptotions  // Arg   17/15   Received By  // Arg   17/15	V Equipment Blank 5	-	1345	-		Contract of the last of the la	1				X				1	
RFI-I(RES) SS-10    IS30   V   V   V   V   V   V   V   V   V	/ ii "		1	6:1	120 - 1		-	-			X 2	5		-	1	
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Special Instructions  Call Cath, Layson at 55/-2474 OR Carol Snyder at 778-5388   Q-estrous    Call Cath, Layson at 55/-2474 OR Carol Snyder at 778-5388   Q-estrous    Call Cath, Layson at 55/-2474 OR Carol Snyder at 778-5388   Q-estrous    Call Cath, Layson at 55/-2474 OR Carol Snyder at 778-5388   Q-estrous    Call Cath, Layson at 55/-2474 OR Carol Snyder at 778-5388   Q-estrous    (A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are possible Hazard Longer than 3 months)  [A fee may be assessed if samples are poss	RFI-1 (RES) SS-10	V	1330	V	V	-								1	1	$\Box$
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## **CORDOVA RFI**

MAY 1998 ANALYTICAL REPORT

LOT #: A8E110118



Quanterra Incorporated 4101 Shuffel Drive, NW North Canton, Ohio 44720

330 497-9396 Telephone 330 497-0772 Fax

## ANALYTICAL REPORT

CORDOVA RFI MAY 1998

Lot #: A8E110118

Carol Snyder

3M Company

QUANTERRA INCORPORATED

Jeffrey C. Smith Project Manager

June 15, 1998

## CASE NARRATIVE

The following report contains the analytical results for eight water samples and four solid samples submitted to Quanterra-North Canton by 3M Company from the Cordova RFI May 1998 Site. The samples were received May 9, 1998 according to documented sample acceptance procedures.

Quanterra-North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided by facsimile transmission to Carol Snyder on June 5, 1998.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

The coolers were received at the laboratory at temperatures of 1.1, 2.3, 0.6 and 1.3° C.

## SUPPLEMENTAL QC INFORMATION

### SAMPLE RECEIVING

Three 40ml volatile vials for sample Trip blank were received with headspace.

One liter amber glass for sample RFI-I (RES)-MW 8-90(s) was received broken One liter amber glass for sample RFI-I (RES) MW3-94 was received with a cracked lid, which was replaced upon receipt.

#### GC/MS VOLATILES

The matrix spike/matrix spike duplicate associated with batch 8134287 failed surrogate recovery criteria. The laboratory control sample associated with this batch was in control. This is believed to be a matrix effect; therefore, no further corrective action was taken.

Surrogate recovery is outside acceptance limits in sample RFI-I (RES) MW8-90 (MS/MSD). Reextraction and/or reanalysis achieved similar results; therefore, the original data has been reported.

## GC SEMIVOLATILES - Organochlorine Pesticides

Sample RFI-I (RES) SS-6 was diluted due to matrix effects and was ND; therefore, the detection limites were elevated.

## CASE NARRATIVE (continued)

## GC SEMIVOLATILES - Polychlorinated Biphenyls

Sample RFI-I (RES) SS-6 was diluted due to matrix effects and was ND; therefore, the detection limites were elevated.

#### **METALS**

Matrix spike/spike duplicate spike recoveries were outside the acceptance limits for some analytes. The acceptable laboratory control sample analysis data indicated that the analytical system was operating within control and this condition is most likely due to matrix interference. See the Matrix Spike Report for the affected analytes which will be flagged with "N".

Matrix spike/spike duplicate relative percent difference (RPD) exceeded the acceptance limits for some analytes. The imprecision may be attributed to sample heterogeneity. See the Matrix Spike Report for the affected analytes which will be flagged with "\*".

# ANALYTICAL METHODS SUMMARY

#### A8E110118

PARAMETER	ANALYTICAL METHOD
Amenable Cyanide Inductively Coupled Plasma (ICP) Metals Organochlorine Pesticides PCBs	SW846 9012 SW846 6010A SW846 8081A SW846 8082 SW846 9012
Total Cyanide Total Residue as Percent Solids Trace Inductively Coupled Plasma (ICP) Metals Volatile Organics by GC/MS	MCAWW 160.3 MOD SW846 6010A SW846 8260A

#### References:

MCAWW	"Methods for Chem	ical i	Analysi	s of	Water	and	Wastes",
	EPA-600/4-79-020,	March	h 1983	and	subsequ	ent	revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

## SAMPLE SUMMARY

#### A8E110118

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CH39V CH3A1 CH3A2 CH3A3 CH3A7 CH3AA CH3AD CH3AF CH3AG CH3AH CH3AK	001 002 003 004 005 006 007 008 009 010 011	RFI-I (RES) MW3-94 RFI-I (RES) MW1-88 RFI-I (RES) MW8-90 (MS/MSD) FIELD DUPLICATE #4 EQUIPMENT BLANK #3 FIELD BLANK #5 TRIP BLANK RFI-1 (RES) SS-8 FIELD BLANK 11 RFI-1 (RES) SS-9 FIELD DUPLICATE 8 RFI-1 (RES) SS-6	05/07/98 05/08/98 05/08/98 05/08/98 05/08/98 05/08/98 05/08/98 05/08/98 05/08/98 05/08/98	08:44 10:26 10:28 11:19 11:42 08:00 08:15 09:00

#### NOTE (S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.

Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, int filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

## Client Sample ID: RFI-I (RES) MW3-94

### GC Semivolatiles

Lot-Sample #: A8E110118-001 Date Sampled: 05/07/98 17:53 Prep Date: 05/13/98	Work Order #: Date Received: Analysis Date:	05/09/98	Matrix: WATER
Prep Batch #: 8133254 Dilution Factor: 1	Method:	SW846 8081	A
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 0.050	UNITS ug/L
SURROGATE	PERCENT	RECOVERY LIMITS	

(10 - 130) (10 - 116)

RECOVERY 66

56

SURROGATE

Tetrachloro-m-xylene Decachlorobiphenyl

## Client Sample ID: RFI-I (RES) MW1-88

#### GC Semivolatiles

Lot-Sample #: A8E110118-002	Work Order #: CH3A1101	Matrix WATER
Tor-Sample #		

Date Sampled...: 05/08/98 08:44 Date Received..: 05/09/98 Prep Date....: 05/13/98 Analysis Date..: 06/03/98

Prep Batch #...: 8133254

Dilution Factor: 1 Method.....: SW846 8081A

REPORTING

PARAMETER RESULT LIMIT UNITS
Hexachlorobenzene ND 0.050 ug/L

 SURROGATE
 RECOVERY
 LIMITS

 Tetrachloro-m-xylene
 82
 (10 - 130)

 Decachlorobiphenyl
 129 \*
 (10 - 116)

\* Surrogate recovery is outside stated control limits.

NOTE (S):

# Client Sample ID: RFI-I (RES) MW8-90 (MS/MSD)

#### GC Semivolatiles

Lot-Sample #: A8E110118-003 Date Sampled: 05/08/98 10:26 Prep Date: 05/13/98	Work Order #: Date Received: Analysis Date:	05/09/98
Prep Batch #: 8133254 Dilution Factor: 1	Method:	SW846 8081A
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT UNITS 0.050 ug/L
SURROGATE Tetrachloro-m-xylene Decachlorobiphenyl	PERCENT RECOVERY 68 104	RECOVERY LIMITS (10 - 130) (10 - 116)

## Client Sample ID: RFI-I (RES) MW8-90 (MS/MSD)

#### GC/MS Volatiles

Lot-Sample #...: A8E110118-003 Work Order #...: CH3A2103 Matrix.....: WATER

Date Sampled...: 05/08/98 10:26 Date Received..: 05/09/98 Prep Date....: 05/14/98 Analysis Date..: 05/14/98

Prep Batch # ...: 8134287

Dilution Factor: 1 Method.....: SW846 8260A

		REPORTING	
PARAMETER	RESULT	LIMIT	UNITS
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrolein	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Allyl chloride	ND	2.0	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
2-Butanone (MEK)	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
loroethane	ND	2.0	ug/L
chloroform	ND	0.25	ug/L
Chloromethane	ND	2.0	ug/L
Chloroprene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,2-Dibromo-3-chloro-	ND	2.0	ug/L
propane			
1,2-Dibromoethane (EDB)	ND	1.0	ug/L
Dibromomethane	ND	1.0	ug/L
trans-1,4-Dichloro-	ND	5.0	ug/L
2-butene			
Dichlorodifluoromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND •	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	0.50	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Ethyl methacrylate 2-Hexanone	ND	10	ug/L
Iodomethane	ND	1.0	ug/L
	ND	40	ug/L
Isobutyl alcohol Methacrylonitrile	ND	10	ug/L
The state of the s	ND	1.0	ug/L
ethylene chloride	ND		-31-

(Continued on next page)

# Client Sample ID: RFI-I (RES) MW8-90 (MS/MSD)

### GC/MS Volatiles

Tot-Sample #: A8E110118-003 W	Work Order	#: CH3A2103	Matrix: WATER
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	The second second	REPORTIN		
PARAMETER	RESULT	LIMIT	UNITS	
Methyl methacrylate	ND	1.0	ug/L	
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	
Propionitrile	ND	4.0	ug/L	
Styrene	ND	1.0	ug/L	
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	
Tetrachloroethene	ND	1.0	ug/L	
Toluene	ND	1.0	ug/L	
1,1,1-Trichloroethane	ND	1.0	ug/L	
1,1,2-Trichloroethane	ND	1.0	ug/L	
Trichloroethene	ND	1.0	ug/L	
Trichlorofluoromethane	ND	2.0	ug/L	
1,2,3-Trichloropropane	ND	1.0	ug/L	
Vinyl acetate	ND	2.0	ug/L	
Vinyl chloride	ND	2.0	ug/L	
Xylenes (total)	ND	1.0	ug/L	
-Dichlorobenzene	ND	1.0	ug/L	
p-Dichlorobenzene	ND	1.0	ug/L	
o-Dichlorobenzene	ND	1.0	ug/L	
	PERCENT	RECOVER	Y	
SURROGATE	RECOVERY	LIMITS		
1,2-Dichloroethane-d4	90	(69 - 1	27)	
Toluene-d8	93	(90 - 1	12)	
Bromofluorobenzene	85 *	(87 - 1	14)	

NOTE (S):

Surrogates outside acceptance criteria due to demonstrated matrix effect.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

# Client Sample ID: FIELD DUPLICATE #4

#### GC/MS Volatiles

Lot-Sample #...: A8E110118-004 Work Order #...: CH3A3101 Matrix....: WATER

Date Sampled...: 05/08/98 10:28 Date Received..: 05/09/98 Prep Date....: 05/14/98 Analysis Date..: 05/14/98

Prep Batch #...: 8134287

Dilution Factor: 1 Method.....: SW846 8260A

	100000	REPORTING	UNITS
PARAMETER	RESULT	LIMIT	ug/L
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrolein	ND	20	ug/L
Acrylonitrile	ND		ug/L
Allyl chloride	ND	2.0	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
2-Butanone (MEK)	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
hloroethane	ND	2.0	ug/L
Chloroform	ND	0.25	ug/L
Chloromethane	ND	2.0	ug/L
Chloroprene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,2-Dibromo-3-chloro- propane	ND	2.0	ug/L
1,2-Dibromoethane (EDB)	ND	1.0	ug/L
Dibromomethane	ND	1.0	ug/L
trans-1,4-Dichloro- 2-butene	ND	5.0	ug/L
Dichlorodifluoromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND .	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	0.50	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Ethyl methacrylate	ND	1.0	ug/L
2-Hexanone	ND	10	ug/L
Iodomethane	ND	1.0	ug/L
Isobutyl alcohol	ND	40	ug/L
	ND	10	ug/L
Methacrylonitrile Methylene chloride	ND	1.0	ug/L

(Continued on next page)

## Client Sample ID: FIELD DUPLICATE #4

### GC/MS Volatiles

Lot-Sample #...: A8E110118-004 Work Order #...: CH3A3101 Matrix..... WATER

		REPORTIN	IG .	
PARAMETER	RESULT	LIMIT	UNITS	
Methyl methacrylate	ND	1.0	ug/L	
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	
Propionitrile	ND	4.0	ug/L	
Styrene	ND	1.0	ug/L	
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	
Tetrachloroethene	ND	1.0	ug/L	
Toluene	ND	1.0	ug/L	
1,1,1-Trichloroethane	ND	1.0	ug/L	
1,1,2-Trichloroethane	ND	1.0	ug/L	
Trichloroethene	ND	1.0	ug/L	
Trichlorofluoromethane	ND	2.0	ug/L	
1,2,3-Trichloropropane	ND	1.0	ug/L	
Vinyl acetate	ND	2.0	ug/L	
Vinyl chloride	ND	2.0	ug/L	
_Xylenes (total)	ND	1.0	ug/L	
Dichlorobenzene	ND	1.0	ug/L	
-Dichlorobenzene	ND	1.0	ug/L	
o-Dichlorobenzene	ND	1.0	ug/L	
	PERCENT	RECOVER	Y	
SURROGATE	RECOVERY	LIMITS		
1,2-Dichloroethane-d4	92	(69 - 1		
Toluene-d8	97	(90 - 1	12)	
Bromofluorobenzene	95	(87 - 1	14)	

### Client Sample ID: EQUIPMENT BLANK #3

#### GC Semivolatiles

Lot-Sample #: A8E110118-005 Date Sampled: 05/08/98 11:19 Prep Date: 05/13/98 Prep Batch #: 8133254	Work Order #: Date Received: Analysis Date:	05/09/98	Matrix:	WATER
Dilution Factor: 1	Method:	SW846 80812	A	
PARAMETER	RESULT	REPORTING LIMIT	UNITS	
Hexachlorobenzene	ND	0.050	ug/L	
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS		
Tetrachloro-m-xylene	45	(10 - 130)		

42

(10 - 116)

Decachlorobiphenyl

## Client Sample ID: EQUIPMENT BLANK #3

### GC/MS Volatiles

Lot-Sample #...: A8E110118-005 Work Order #...: CH3A7103 Matrix..... WATER

Date Sampled...: 05/08/98 11:19 Date Received..: 05/09/98
Prep Date....: 05/14/98 Analysis Date..: 05/14/98

Prep Batch #...: 8134287

Dilution Factor: 1 Method.....: SW846 8260A

		REPORTING	G
DADAMENT .	RESULT	LIMIT	UNITS
PARAMETER Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrolein	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Allyl chloride	ND	2.0	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
2-Butanone (MEK)	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon distillide	ND	1.0	ug/L
_Chlorobenzene	ND	1.0	ug/L
	ND	2.0	ug/L
hloroethane	0.46	0.25	ug/L
Chloroform	ND	2.0	ug/L
Chloromethane	ND	1.0	ug/L
Chloroprene Dibromochloromethane	ND	1.0	ug/L
	ND	2.0	ug/L
1,2-Dibromo-3-chloro-	ND		
propane	ND	1.0	ug/L
1,2-Dibromoethane (EDB)	ND	1.0	ug/L
Dibromomethane	ND	5.0	ug/L
trans-1,4-Dichloro-	ND	3.0	-3,
2-butene	1770	2.0	ug/L
Dichlorodifluoromethane	ND	1.0	ug/L
1,1-Dichloroethane	ND .	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	0.50	ug/L
trans-1,2-Dichloroethene	ND		ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	
Ethylbenzene	ND	1.0	ug/L
Ethyl methacrylate	ND	1.0	ug/L
2-Hexanone	ND	10	ug/L
Iodomethane	ND	1.0	ug/L
Isobutyl alcohol	ND	40	ug/L
Methacrylonitrile	ND	10	ug/L
Methylene chloride	2.2	1.0	ug/L

(Continued on next page)

# Client Sample ID: EQUIPMENT BLANK #3

### GC/MS Volatiles

Lot-Sample #: A8E110118-005	Work Order	#: CH3A7103	Matrix	WATER
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		REPORTING	
PARAMETER	RESULT	LIMIT	UNITS
Methyl methacrylate	ND	1.0	ug/L
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L
Propionitrile	ND	4.0	ug/L
Styrene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Trichlorofluoromethane	ND	2.0	ug/L
1,2,3-Trichloropropane	ND	1.0	ug/L
Vinyl acetate	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Xylenes (total)	ND	1.0	ug/L
n-Dichlorobenzene	ND	1.0	ug/L
p-Dichlorobenzene	ND	1.0	ug/L
o-Dichlorobenzene	ND	1.0	ug/L
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	_
1,2-Dichloroethane-d4	91	(69 - 127	7)
Toluene-d8	100	(90 - 112	2)
Bromofluorobenzene	94	(87 - 114	1)

# Client Sample ID: EQUIPMENT BLANK #3

### General Chemistry

Lot-Sample #...: A8E110118-005 Work Order #...: CH3A7

Matrix..... WATER

Date Sampled...: 05/08/98 11:19 Date Received..: 05/09/98

	RESULT	RL	UNITS	METHOD	ANALYSIS DATE	BATCH #
PARAMETER Amenable Cyanide	ND ND	0.010	mg/L	SW846 9012	05/21/98	8141163
Amenable Cyalifide		on Factor: 1			05/21/98	8141163
Total Cyanide	ND Dilutio	0.010 on Factor: 1	mg/L	SW846 9012	05/21/98	0111103

### Client Sample ID: FIELD BLANK #5

### GC/MS Volatiles

Lot-Sample #...: A8E110118-006 Work Order #...: CH3AA101 Matrix.....: WATER

Date Sampled...: 05/08/98 11:42 Date Received..: 05/09/98 Prep Date....: 05/21/98 Analysis Date..: 05/21/98

Prep Batch #...: 8141315

Dilution Factor: 1 Method.....: SW846 8260A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrolein	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Allyl chloride	ND	2.0	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
2-Butanone (MEK)	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
loroethane	ND	2.0	ug/L
Chloroform	ND	0.25	ug/L
Chloromethane	ND	2.0	ug/L
Chloroprene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,2-Dibromo-3-chloro- propane	ND	2.0	ug/L
1,2-Dibromoethane (EDB)	ND .	1.0	ug/L
Dibromomethane	ND	1.0	ug/L
trans-1,4-Dichloro- 2-butene	ND	5.0	ug/L
Dichlorodifluoromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND ·	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	0.50	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Ethyl methacrylate	ND	1.0	ug/L
2-Hexanone	ND	10	ug/L
Iodomethane	ND	1.0	ug/L
Isobutyl alcohol	ND	40	ug/L
Methacrylonitrile	ND	10	ug/L
Methacrylonitrile Methylene chloride	1.1	1.0	ug/L

(Continued on next page)

## Client Sample ID: FIKLD BLANK #5

### GC/MS Volatiles

Lot-Sample #: A8E110118-006 Work Ord	r #: CH3AA101	Matrix WATER
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		REPORTING	3	
PARAMETER	RESULT	LIMIT	UNITS	
Methyl methacrylate	ND	1.0	ug/L	
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	
Propionitrile	ND	4.0	ug/L	
Styrene	ND	1.0	ug/L	
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	
Tetrachloroethene	ND	1.0	ug/L	
Toluene	ND	1.0	ug/L	
1,1,1-Trichloroethane	ND	1.0	ug/L	
1,1,2-Trichloroethane	ND	1.0	ug/L	
Trichloroethene	ND	1.0	ug/L	
Trichlorofluoromethane	ND	2.0	ug/L	
1,2,3-Trichloropropane	ND	1.0	ug/L	
	ND	2.0	ug/L	
Vinyl acetate	ND	2.0	ug/L	
Vinyl chloride	ND	1.0	ug/L	
Xylenes (total) -Dichlorobenzene	ND	1.0	ug/L	
	ND	1.0	ug/L	
p-Dichlorobenzene o-Dichlorobenzene	ND	1.0	ug/L	
	PERCENT	RECOVERS	Z	
SURROGATE	RECOVERY	LIMITS		
1,2-Dichloroethane-d4	96	(69 - 12		
Toluene-d8	106	(90 - 13		
Bromofluorobenzene	110	(87 - 13	14)	

#### Client Sample ID: FIKLD BLANK #5

#### GC Semivolatiles

Lot-Sample #: Date Sampled:	05/08/98 11:42	Work Order #: Date Received: Analysis Date:	05/09/98	Matrix: WATER
Prep Date:	,	Analysis bace	00,00,00	
Prep Batch #:	8133254			

Method..... SW846 8081A Dilution Factor: 1

REPORTING

RESULT	LIMIT	UNITS	
ND	0.050	ug/L	
PERCENT	RECOVERY LIMITS		
101 123 *			
	ND PERCENT RECOVERY	ND	ND   0.050   ug/L

NOTE (S) :\_

<sup>\*</sup> Surrogate recovery is outside stated control limits.

## Client Sample ID: TRIP BLANK

### GC/MS Volatiles

Lot-Sample #...: A8E110118-007 Work Order #...: CH3AD101 Matrix....: WATER

Date Sampled...: 05/08/98

Prep Date....: 05/14/98

Date Received..: 05/09/98

Analysis Date..: 05/14/98

Prep Batch #...: 8134287

Dilution Factor: 1 Method.....: SW846 8260A

		REPORTIN	REPORTING		
PARAMETER	RESULT	LIMIT	UNITS		
Acetone	ND	10	ug/L		
Acetonitrile	ND	20	ug/L		
Acrolein	ND	20	ug/L		
Acrylonitrile	ND	20	ug/L		
Allyl chloride	ND	2.0	ug/L		
Benzene	ND	1.0	ug/L		
Bromodichloromethane	ND	1.0	ug/L		
Bromoform	ND	1.0	ug/L		
Bromomethane	ND	2.0	ug/L		
2-Butanone (MEK)	ND	10	ug/L		
Carbon disulfide	ND	1.0	ug/L		
Carbon disulfide	ND	1.0	ug/L		
	ND	1.0	ug/L		
Chlorobenzene	ND	2.0	ug/L		
hloroethane	ND	0.25	ug/L		
Chloroform	ND	2.0	ug/L		
Chloromethane	ND	1.0	ug/L		
Chloroprene Dibromochloromethane	ND	1.0	ug/L		
	ND	2.0	ug/L		
1,2-Dibromo-3-chloro-	142				
propane	ND	1.0	ug/L		
1,2-Dibromoethane (EDB)	ND	1.0	ug/L		
Dibromomethane		5.0	ug/L		
trans-1,4-Dichloro-	ND	3.0	-3/-		
2-butene		2.0	ug/L		
Dichlorodifluoromethane	ND	1.0	ug/L		
1,1-Dichloroethane	ND .	1.0	ug/L		
1,2-Dichloroethane	ND	1.0	ug/L		
1,1-Dichloroethene	ND		ug/L		
trans-1,2-Dichloroethene	ND	0.50			
1,2-Dichloropropane	ND	1.0	ug/L		
cis-1,3-Dichloropropene	ND	1.0	ug/L		
trans-1,3-Dichloropropene	ND	1.0	ug/L		
Ethylbenzene	ND	1.0	ug/L		
Ethyl methacrylate	ND	1.0	ug/L		
2-Hexanone	ND	10	ug/L		
Iodomethane	ND	1.0	ug/L		
Isobutyl alcohol	ND	40	ug/L		
Methacrylonitrile	ND	10	ug/L		
Methylene chloride	1.2	1.0	ug/L		

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### Client Sample ID: TRIP BLANK

### GC/MS Volatiles

Lot-Sample #: A8E110118-007	Work Order #: CH3AD101	Matrix WATER
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Danaumen .	RESULT	REPORTING LIMIT	UNITS	
PARAMETER Methyl methacrylate	ND	1.0	ug/L	
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	
Propionitrile	ND	4.0	ug/L	
Styrene	ND	1.0	ug/L	
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	
Tetrachloroethene	ND	1.0	ug/L	
Toluene	ND	1.0	ug/L	
1,1,1-Trichloroethane	ND	1.0	ug/L	
1,1,2-Trichloroethane	ND	1.0	ug/L	
Trichloroethene	ND	1.0	ug/L	
Trichlorofluoromethane	ND	2.0	ug/L	
1,2,3-Trichloropropane	ND	1.0	ug/L	
Vinyl acetate	ND	2.0	ug/L	
Vinyl chloride	ND	2.0	ug/L	
Xylenes (total)	ND	1.0	ug/L	
Dichlorobenzene	ND	1.0	ug/L	
p-Dichlorobenzene	ND	1.0	ug/L	
o-Dichlorobenzene	ND	1.0	ug/L	
	PERCENT	RECOVERY		
SURROGATE	RECOVERY	LIMITS	-	
1,2-Dichloroethane-d4	92	(69 - 127		
Toluene-d8	98	(90 - 112		
Bromofluorobenzene	91	(87 - 114	:)	

## Client Sample ID: RFI-1 (RES) SS-8

#### GC Semivolatiles

Tot-Sample #: A8E110118-008	Work Order #: CH3AF103	Matrix SOLID
TOP-Sample # AGELIULIO-000	HOTTE OFFICE HELLE	

Date Sampled...: 05/08/98 08:00 Date Received..: 05/09/98 Prep Date....: 05/27/98 Analysis Date..: 05/28/98

Prep Batch #...: 8147142

Dilution Factor: 1

\* Moisture....: 17 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS	
Aroclor 1016	ND	1.2	mg/kg	
Aroclor 1221	ND	1.2	mg/kg	
Aroclor 1232	ND	1.2	mg/kg	
Aroclor 1242	ND	1.2	mg/kg	
Aroclor 1248	ND	1.2	mg/kg	
Aroclor 1254	ND	1.2	mg/kg	
Aroclor 1260	ND	1.2	mg/kg	
	PERCENT	RECOVERY		
SURROGATE '	RECOVERY	LIMITS	_	
Tetrachloro-m-xylene	130 *	(8.0- 129	)	
Decachlorobiphenyl	124	(0.0- 138	)	

#### OTE(S):

<sup>\*</sup> Surrogate recovery is outside stated control limits.

Client Sample ID: RFI-1 (RES) SS-8

#### TOTAL Metals

Matrix....: SOLID Lot-Sample #...: A8E110118-008

Date Sampled...: 05/08/98 08:00 Date Received..: 05/09/98

\* Moisture....: 17

NOTE (S):

WORK PREPARATION-REPORTING ANALYSIS DATE ORDER # UNITS METHOD

LIMIT PARAMETER RESULT

Prep Batch #...: 8135119

05/15-05/18/98 CH3AF102 SW846 6010A ug/kg 5990 143000 Cobalt

Dilution Factor: 1

Client Sample ID: RFI-1 (RES) SS-8

#### General Chemistry

Lot-Sample #...: A8E110118-008 Work Order #...: CH3AF

Matrix....: SOLID

Date Sampled...: 05/08/98 08:00 Date Received..: 05/09/98

\* Moisture....: 17

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	83.4	0.10	*	MCAWW 160.3 MOD	05/12-05/13/98	8132118

NOTE (S):

RL Reporting Limit

## Client Sample ID: FIELD BLANK 11

#### GC Semivolatiles

Lot-Sample #: A8E110118-009 Date Sampled: 05/08/98 08:15 Prep Date: 05/13/98	Work Order #: Date Received: Analysis Date:	05/09/98
Prep Batch #: 8133254 Dilution Factor: 1	Method:	SW846 8081A
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT UNITS 0.050 ug/L
SIDBOGATE	PERCENT	RECOVERY LIMITS

80

114

Tetrachloro-m-xylene

Decachlorobiphenyl

(10 - 130)

(10 - 116)

# Client Sample ID: FIKLD BLANK 11

## GC Semivolatiles

Lot-Sample #: Date Sampled: Prep Date:	05/08/98 08:15	Work Order #: Date Received: Analysis Date:	05/09/98	Matrix	WATER
Prep Batch #: Dilution Factor:		Method:	SW846 8082		

	RESULT	REPORTING LIMIT	UNITS
PARAMETER			ug/L
Aroclor 1016	ND	1.0	
Aroclor 1221	ND	1.0	ug/L
Aroclor 1232	ND	1.0	ug/L
Aroclor 1242	ND	1.0	ug/L
Aroclor 1248	ND	1.0	ug/L
Aroclor 1254	ND	1.0	ug/L
Aroclor 1260	ND	1.0	ug/L
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	_
Tetrachloro-m-xylene	80	(10 - 130	
Decachlorobiphenyl	71	(10 - 116	5)

## Client Sample ID: FIKID BLANK 11

#### TOTAL Metals

Matrix....: WATER Lot-Sample #...: A8E110118-009

Date Sampled...: 05/08/98 08:15 Date Received..: 05/09/98

PREPARATION- WORK REPORTING ANALYSIS DATE ORDER # LIMIT UNITS METHOD PARAMETER RESULT

Prep Batch #...: 8132253

ug/L SW846 6010A 05/13-05/18/98 CH3AG101 7.0 Cobalt ND

Dilution Factor: 1

No a restaurant to the less

Client Sample ID: RFI-1 (RES) SS-9

## GC Semivolatiles

Lot-Sample #:	A8E110118-010	Work Order #:	CH3AH103	Matrix SOLID
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Date Sampled...: 05/08/98 09:00 Date Received..: 05/09/98 Prep Date....: 05/14/98 Analysis Date..: 05/29/98

Prep Batch #...: 8134157

Dilution Factor: 1

% Moisture....: 11 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	37	ug/kg
Aroclor 1221	ND	37	ug/kg
Aroclor 1232	ND	37	ug/kg
Aroclor 1242	ND	37	ug/kg
Aroclor 1248	ND	37	ug/kg
Aroclor 1254	ND	37	ug/kg
Aroclor 1260	ND	37	ug/kg
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	_
Tetrachloro-m-xylene	103	(8.0- 129	)
Decachlorobiphenyl	107	(0.0- 138	)

NOTE (S):

## Client Sample ID: RFI-1 (RES) SS-9

#### TOTAL Metals

Matrix....: SOLID Lot-Sample #...: A8E110118-010

Date Sampled...: 05/08/98 09:00 Date Received..: 05/09/98

% Moisture....: 11

PREPARATION- WORK REPORTING ANALYSIS DATE ORDER # LIMIT UNITS METHOD PARAMETER RESULT

Prep Batch #...: 8135119

05/15-05/18/98 CH3AH102 5620 ug/kg SW846 6010A Cobalt 38800

Dilution Factor: 1

NOTE (S):

Client Sample ID: RFI-1 (RES) SS-9

#### General Chemistry

Lot-Sample #...: A8E110118-010 Work Order #...: CH3AH

Matrix....: SOLID

Date Sampled...: 05/08/98 09:00 Date Received..: 05/09/98

% Moisture....: 11

PREP PREPARATION-ANALYSIS DATE BATCH #

PARAMETER Percent Solids

UNITS RESULT 89.0

METHOD

MCAWW 160.3 MOD 05/12-05/13/98 8132118

Dilution Factor: 1

#### NOTE (S):

RL Reporting Limit

# Client Sample ID: FIELD DUPLICATE 8

### GC Semivolatiles

Tot-Sample #: A8E110118-011	Work Order #: CH3AK103	Matrix: SOLID

Date Sampled...: 05/08/98 09:00 Date Received..: 05/09/98
Prep Date....: 05/14/98 Analysis Date..: 05/29/98

Prep Batch #...: 8134157

Dilution Factor: 1 % Moisture....: 11

Method....: SW846 8082

PARAMETER	RESULT	REPORTIN LIMIT	UNITS	
Aroclor 1016	ND	37	ug/kg	
Aroclor 1221	ND	37	ug/kg	
Aroclor 1232	ND	37	ug/kg	
Aroclor 1242	ND	37	ug/kg	
Aroclor 1248	ND	37	ug/kg	
Aroclor 1254	ND	37	ug/kg	
Aroclor 1260	ND	37	ug/kg	
	PERCENT	RECOVERY		
SURROGATE	RECOVERY	LIMITS		
Tetrachloro-m-xylene	112	(8.0- 12	(9)	
Decachlorobiphenyl	131	(0.0- 13	8)	

OTE (S)

# Client Sample ID: FIKLD DUPLICATE 8

#### TOTAL Metals

Matrix....: SOLID Lot-Sample #...: A8E110118-011

Date Sampled...: 05/08/98 09:00 Date Received..: 05/09/98

\* Moisture ....: 11

PREPARATION-REPORTING

ANALYSIS DATE ORDER # LIMIT UNITS METHOD PARAMETER RESULT

Prep Batch #...: 8135119

05/15-05/18/98 CH3AK102 SW846 6010A 5650 ug/kg Cobalt 58300

Dilution Factor: 1

NOTE (S):

## Client Sample ID: FIELD DUPLICATE 8

## General Chemistry

Lot-Sample #...: A8E110118-011 Work Order #...: CH3AK Matrix.....: SOLID

Date Sampled...: 05/08/98 09:00 Date Received..: 05/09/98

% Moisture....: 11

 PARAMETER
 RESULT
 RL
 UNITS
 METHOD
 ANALYSIS DATE
 BATCH #

 Percent Solids
 88.5
 0.10
 %
 MCAWW 160.3 MOD
 05/12-05/13/98
 8132118

Dilution Factor: 1

NOTE (S):

RL Reporting Limit

# Client Sample ID: RFI-1 (RES) SS-6

## GC Semivolatiles

Lot-Sample #: A8E110118-012 Date Sampled: 05/08/98 09:40 Prep Date: 05/12/98 Prep Batch #: 8132107	Work Order #: Date Received: Analysis Date:	05/09/98	Matrix: SOLID
Dilution Factor: 10 % Moisture: 12	Method:	SW846 8081A	
PARAMETER Hexachlorobenzene	RESULT ND		NITS ng/kg
SURROGATE Tetrachloro-m-xylene Decachlorobiphenyl	PERCENT RECOVERY 0.0 DIL,*	RECOVERY LIMITS (8.0- 129) (0.0- 138)	

### NOTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Decachlorobiphenyl

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

# Client Sample ID: RFI-1 (RES) SS-6

#### GC Semivolatiles

Tot-Sample #:	A8E110118-012	Work Order #:	CH3AL102	Matrix:	SOLID
Lor-Sample #:	ASELIULIO-ULA	MOTY OTHER H	CILCIANCE		

Date Sampled...: 05/08/98 09:40 Date Received..: 05/09/98 Prep Date....: 05/12/98 Analysis Date..: 06/02/98

Prep Batch #...: 8132108

Dilution Factor: 20

% Moisture....: 12 Method.....: SW846 8082

		REPORTIN	IG	
PARAMETER	RESULT	LIMIT	UNITS	
Aroclor 1016	ND	750	ug/kg	14
Aroclor 1221	ND	750	ug/kg	
Aroclor 1232	ND	750	ug/kg	
Aroclor 1242	ND	750	ug/kg	
Aroclor 1248	ND	750	ug/kg	
Aroclor 1254	ND	750	ug/kg	
Aroclor 1260	ND	750	ug/kg	
	PERCENT	RECOVERS	7	
SURROGATE	RECOVERY	LIMITS		
Tetrachloro-m-xylene	86 DIL	(8.0- 12	29)	
Decachlorobiphenyl	202 DIL,*	(0.0- 13	38)	

#### NOTE (S)

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

Client Sample ID: RFI-1 (RES) SS-6

## General Chemistry

Matrix....: SOLID Lot-Sample #...: A8E110118-012 Work Order #...: CH3AL

Date Sampled...: 05/08/98 09:40 Date Received..: 05/09/98

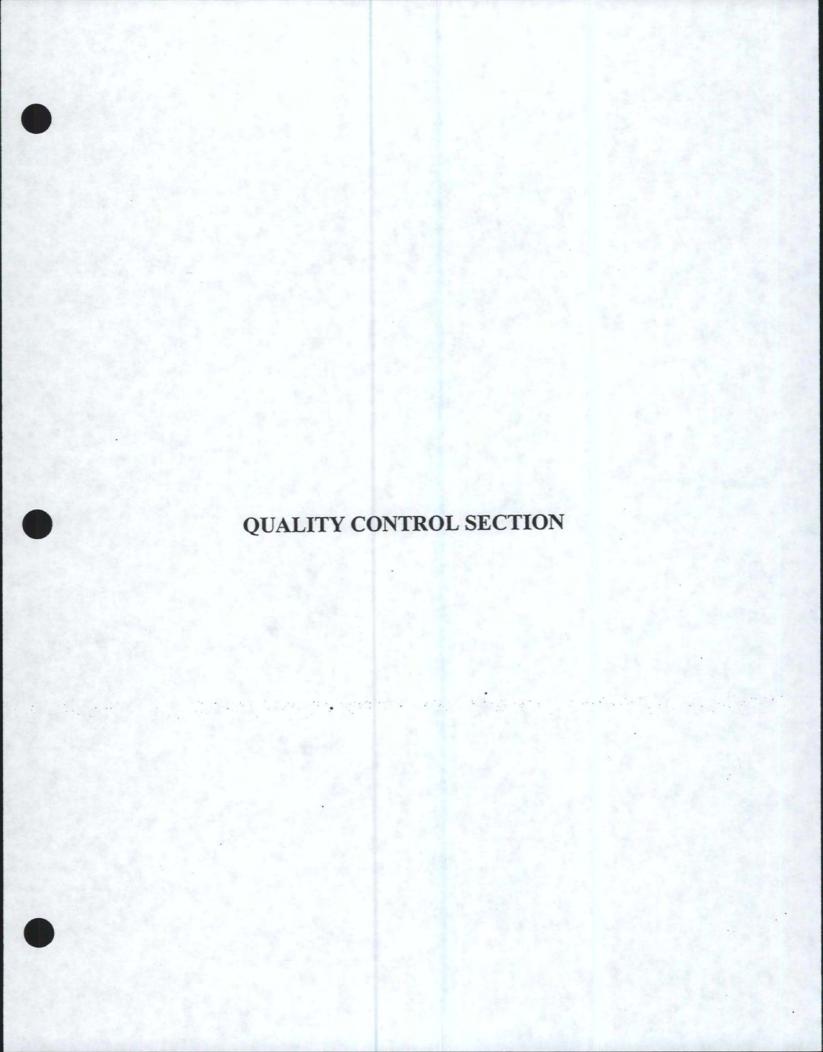
% Moisture....: 12

PREPARATION- PREP ANALYSIS DATE BATCH # METHOD UNITS RESULT RL PARAMETER MCAWW 160.3 MOD 05/12-05/13/98 8132118 0.10 87.5 Percent Solids

Dilution Factor: 1

NOTE (S):

RL Reporting Limit



# QUALITY CONTROL ELEMENTS OF SW-846 METHODS

Quanterra® Incorporated conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

OC BATCH

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. Quanterra requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. Failure to meet the established recovery guidelines requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). Failure of the RPDs to fall within the laboratory-generated acceptance windows requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the MS/MSD RPDs are within acceptance criteria, the batch is acceptable.

METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except for the common laboratory contaminants indicated below.

Volatile (GC or GC/MS)	Semivolatile (GC/MS)	Metals
Methylene chloride Acetone 2-Butanone	Phthalate Esters	Copper Iron Zinc Lead*

<sup>\*</sup> for analyses run on TJA Trace ICP or GFAA only

## QUALITY CONTROL ELEMENTS OF SW-846 METHODS (continued)

#### METHOD BLANK (continued)

The listed volatile and semivolatile compounds may be present in concentrations up to 5 times the reporting limits. The listed metals may be present in concentrations up to 2 times the reporting limit or must be twenty fold less than the results of the environmental samples. Failure to meet these Method Blank criteria requires the repreparation and reanalysis of all samples in the QC batch.

### MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. When these values fail to meet acceptance criteria, the data is reviewed to determine the cause. If, in the analyst's judgment, sample matrix effects are indicated, no corrective action is performed. Otherwise, the MS/MSD and the environmental sample used to prepare them are reprepared and reanalyzed.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch.

#### SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample are spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

The acceptance criteria do not apply to samples that are diluted. If the dilution is more than 5X, the recoveries will be reported as diluted out. All other surrogate recoveries will be reported. If the LCS, LCSD, or the Method Blank surrogates fail to meet recovery criteria (exception for dilutions), the entire batch of samples is reprepared and reanalyzed.

If the surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank and the associated sample(s) are ND, the batch is acceptable. If the surrogate recoveries are outside criteria for environmental or MS/MSD samples, the batch may be acceptable based on the analyst's judgment that sample matrix effects are indicated.

For the GC/MS BNA methods, the surrogate criteria is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide/PCB, PAH, TPH, and Herbicide methods, the surrogate criteria is that one of two surrogate compounds meet acceptance criteria.

## GC/MS Volatiles

Client Lot #...: A8E110118 Work Order #...: CHD4R102 Matrix.....: WATER

LCS Lot-Sample#: A8E210000-315

Prep Date....: 05/21/98 Analysis Date..: 05/21/98

Prep Batch #...: 8141315

Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY	METHOD
1,1-Dichloroethene	104	(87 - 113)	SW846 8260A
Trichloroethene	97	(89 - 115)	SW846 8260A
Chlorobenzene	103	(89 - 119)	SW846 8260A
Toluene	107	(81 - 117)	SW846 8260A
Benzene	103	(77 - 126)	SW846 8260A
		PERCENT	RECOVERY
SURROGATE		RECOVERY	LIMITS
1,2-Dichloroethane-d4		91	(69 - 127)
Toluene-d8		106	(90 - 112)
Bromofluorobenzene		109	(87 - 114)

## NOTE (S):

rulations are performed before rounding to avoid round-off errors in calculated results.

d print denotes control parameters

## GC/MS Volatiles

Client Lot #...: A8E110118 Work Order #...: CH6CN102 Matrix.....: WATER

LCS Lot-Sample#: A8E140000-287

Prep Date....: 05/14/98 Analysis Date..: 05/14/98

Prep Batch #...: 8134287

Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
1,1-Dichloroethene	95	(87 - 113)	SW846 8260A
Trichloroethene	91	(89 - 115)	SW846 8260A
Chlorobenzene	100	(89 - 119)	SW846 8260A
Toluene	97	(81 - 117)	SW846 8260A
Benzene	95	(77 - 126)	SW846 8260A
		PERCENT	RECOVERY
SURROGATE		RECOVERY	LIMITS
1,2-Dichloroethane-d4		88	(69 - 127)
Toluene-d8		98	(90 - 112)
Bromofluorobenzene		92	(87 - 114)

#### NOTE (S) .

culations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

#### GC Semivolatiles

Client Lot #...: A8E110118 Work Order #...: CH3NF102 Matrix.....: SOLID

LCS Lot-Sample#: A8E120000-107

Prep Date....: 05/12/98 Analysis Date..: 05/30/98

Prep Batch # ...: 8132107

Dilution Factor: 1

	PERCENT	RECOVERY	
PARAMETER	RECOVERY	LIMITS	METHOD
Lindane	59	(52 - 108)	SW846 8081A
Heptachlor	58	(53 - 130)	SW846 8081A
Aldrin	49	(43 - 116)	SW846 8081A
Dieldrin	62	(62 - 107)	SW846 8081A
Endrin	66	(64 - 127)	SW846 8081A
4,4'-DDT	74	(52 - 128)	SW846 8081A
		PERCENT	RECOVERY
SURROGATE		RECOVERY	LIMITS
Tetrachloro-m-xylene	-	68	(8.0- 129)
Decachlorobiphenyl		64	(0.0- 138)

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results. Bold print denotes control parameters

## GC Semivolatiles

Client Lot #...: A8E110118 Work Order #...: CH58X102 Matrix.....: WATER

LCS Lot-Sample#: A8E130000-254

Prep Date....: 05/13/98 Analysis Date..: 05/30/98

Prep Batch #...: 8133254

Dilution Factor: 1

	PERCENT	RECOVERY LIMITS	METHOD
PARAMETER			
Lindane	84	(63 - 122)	SW846 8081A
Heptachlor	80	(56 - 125)	SW846 8081A
Aldrin	75	(60 - 117)	SW846 8081A
Dieldrin	95	(63 - 122)	SW846 8081A
Endrin	71	(48 - 129)	SW846 8081A
4,4'-DDT	93	(55 - 128)	SW846 8081A
	1.0	PERCENT	RECOVERY
SURROGATE		RECOVERY	LIMITS
Tetrachloro-m-xylene	7 7 1 A 7 A 1	66	(10 - 130)
Decachlorobiphenyl		70	(10 - 116)

NOTE(S):

culations are performed before rounding to avoid round-off errors in calculated results.

old print denotes control parameters

#### GC Semivolatiles

Client Lot #...: A8E110118 Work Order #...: CHFPP102-LCS Matrix.....: SOLID

LCS Lot-Sample#: A8E270000-142 CHFPP103-LCSD

Prep Date....: 05/27/98 Analysis Date..: 05/28/98

Prep Batch #...: 8147142

Dilution Factor: 20

DADAMERED	PERCENT	RECOVERY	RPD LIMITS	METHOD
PARAMETER Aroclor 1016	121	(60 - 133)		SW846 8082
AIOCIOI 1010	124	(60 - 133)	2.3 (0-37)	SW846 8082
Aroclor 1260	124	(59 - 129)		SW846 8082
AFOCIOI 1260	126	(59 - 129)	2.0 (0-35)	SW846 8082
		PERCENT	RECOVERY	
SURROGATE		RECOVERY	LIMITS	
Tetrachloro-m-xylene		193 DIL,*	(8.0- 129)	
		198 DIL,*	(8.0 - 129)	
Decachlorobiphenyl		168 DIL,*	(0.0-138)	
pecacinate prompt		175 DIL,*	(0.0- 138)	

#### NOTE (S):

culations are performed before rounding to avoid round-off errors in calculated results.

L The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

#### GC Semivolatiles

Client Lot #...: A8E110118 Work Order #...: CH4JG102-LCS Matrix..... WATER

LCS Lot-Sample#: A8E130000-104 CH4JG103-LCSD

Prep Date....: 05/13/98 Analysis Date..: 05/22/98

Prep Batch #...: 8133104

Dilution Factor: 2

	PERCENT	RECOVERY LIMITS	RPD LIMITS	METHOD
PARAMETER	RECOVERY		RPD DIFFILIS	
Aroclor 1016	91	(66 - 111)		SW846 8082
	88	(66 - 111)	2.4 (0-23)	SW846 8082
Aroclor 1260	93	(65 - 111)		SW846 8082
	92	(65 - 111)	1.1 (0-23)	SW846 8082
		PERCENT	RECOVERY	
SURROGATE		RECOVERY	LIMITS	
Tetrachloro-m-xylene		96	(10 - 130)	
		93	(10 - 130)	
Decachlorobiphenyl		92	(10 - 116)	
		90	(10 - 116)	

NOTE(S):

#### GC Semivolatiles

Client Lot #...: A8E110118 Work Order #...: CH5JF102 Matrix.....: SOLID

LCS Lot-Sample#: A8E140000-157

Prep Date....: 05/14/98 Analysis Date..: 05/29/98

Prep Batch #...: 8134157

Dilution Factor: 2

PARAMETER	PERCENT	RECOVERY LIMITS	METHOD	
Aroclor 1016	95	(60 - 133)	SW846 8082	
Aroclor 1260	100	(59 - 129)	SW846 8082	
		PERCENT	RECOVERY	
SURROGATE		RECOVERY	LIMITS	
Tetrachloro-m-xylene		98	(8.0- 129)	
Decachlorobiphenyl		106	(0.0- 138)	

NOTE (S):

#### GC Semivolatiles

Client Lot #...: A8E110118 Work Order #...: CH3NG102 Matrix.....: SOLID

LCS Lot-Sample#: A8E120000-108

Prep Date....: 05/12/98 Analysis Date..: 05/27/98

Prep Batch # ...: 8132108

Dilution Factor: 2

PERCENT RECOVERY

PARAMETER RECOVERY LIMITS METHOD

PARAMETER 93 (60 - 133) SW846 8082

Aroclor 1016 93 (60 - 133) SW846 8082 Aroclor 1260 100 (59 - 129) SW846 8082

SURROGATE PERCENT RECOVERY
RECOVERY
98 LIMITS
(8.0- 129)

Tetrachloro-m-xylene 98 (8.0-129)
Decachlorobiphenyl 115 (0.0-138)

NOTE (S):

#### TOTAL Metals

Client Lot # ...: A8E110118

Matrix....: WATER

PERCENT RECOVERY

PREPARATION-

PARAMETER

RECOVERY

LIMITS METHOD

ANALYSIS DATE WORK ORDER #

Cobalt 96

(83 - 107) SW846 6010A

ICS Lot-Sample#: A8E120000-253 Prep Batch #...: 8132253

Dilution Factor: 1

NOTE (S):

#### TOTAL Metals

Client Lot # ...: A8E110118

Matrix....: SOLID

PERCENT

RECOVERY

PREPARATION-

PARAMETER

RECOVERY LIMITS METHOD

ANALYSIS DATE WORK ORDER #

LCS Lot-Sample#: A8E150000-119 Prep Batch #...: 8135119

Cobalt

93

(80 - 104) SW846 6010A

05/15-05/18/98 CH6F4102

Dilution Factor: 1

NOTE (S):

#### General Chemistry

Client Lot #...: A8E110118

Matrix....: WATER

PERCENT

RECOVERY

PREPARATION- PREP

BATCH #

PARAMETER Total Cyanide RECOVERY LIMITS METHOD

ANALYSIS DATE

Work Order #: CHC8E102 LCS Lot-Sample#: A8E210000-163

75

(70 - 130) SW846 9012 Dilution Factor: 1

05/21/98

8141163

NOTE (S):

## GC/MS Volatiles

Client Lot #...: A8E110118

Work Order #...: CHD4R101

Matrix....: WATER

MB Lot-Sample #: A8E210000-315

Prep Date....: 05/21/98 Prep Batch #...: 8141315

Analysis Date..: 05/21/98 Dilution Factor: 1

				-
DE	$\neg$	חת	TAI	
RE	PU	L'A	TTA	G

DADAMED	RESU	т.т	LIMIT	UNITS	METHOD
PARAMETER	ND		10	ug/L	SW846 8260A
Acetone Acetonitrile	ND		20	ug/L	SW846 8260A
	ND		20	ug/L	SW846 8260A
Acrolein	ND		20	ug/L	SW846 8260A
Acrylonitrile	ND		2.0	ug/L	SW846 8260A
Allyl chloride	ND		1.0	ug/L	SW846 8260A
Benzene	ND		1.0	ug/L	SW846 8260A
Bromodichloromethane	ND		1.0	ug/L	SW846 8260A
Bromoform	ND		2.0	ug/L	SW846 8260A
Bromomethane	ND		10	ug/L	SW846 8260A
2-Butanone (MEK)	ND		1.0	ug/L	SW846 8260A
Carbon disulfide	ND		1.0	ug/L	SW846 8260A
Carbon tetrachloride	ND		1.0	ug/L	SW846 8260A
Chlorobenzene	ND		2.0	ug/L	SW846 8260A
loroethane			0.25	ug/L	SW846 8260A
chloroform	ND		2.0	ug/L	SW846 8260A
Chloromethane	ND		1.0	ug/L	SW846 8260A
Chloroprene	ND		1.0	ug/L	SW846 8260A
Dibromochloromethane	ND		2.0	ug/L	SW846 8260A
1,2-Dibromo-3-chloro- propane	ND		2.0		
1,2-Dibromoethane (EDB)	ND		1.0	ug/L	SW846 8260A
Dibromomethane	ND		1.0	ug/L	SW846 8260A
trans-1,4-Dichloro- 2-butene	ND		5.0	ug/L	SW846 8260A
Dichlorodifluoromethane	ND		2.0	ug/L	SW846 8260A
	ND	- 1 S	1.0	ug/L	SW846 8260A
1,1-Dichloroethane	ND		1.0	ug/L	SW846 8260A
1,2-Dichloroethane	ND		1.0	ug/L	SW846 8260A
1,1-Dichloroethene	ND		0.50	ug/L	SW846 8260A
trans-1,2-Dichloroethene	ND		1.0	ug/L	SW846 8260A
1,2-Dichloropropane	ND		1.0	ug/L	SW846 8260A
cis-1,3-Dichloropropene			1.0	ug/L	SW846 8260A
trans-1,3-Dichloropropene	ND		1.0	ug/L	SW846 8260A
Ethylbenzene	ND		1.0	ug/L	SW846 8260A
Ethyl methacrylate	ND		10	ug/L	SW846 8260A
2-Hexanone	ND		1.0	ug/L	SW846 8260A
Iodomethane	ND			ug/L	SW846 8260A
Isobutyl alcohol	ND		40		SW846 8260A
Methacrylonitrile	ND		10	ug/L	SW846 8260A
thylene chloride	ND	~	1.0	ug/L	SW846 8260A
thyl methacrylate	ND		1.0	ug/L	5W646 826UA
****** INVALID DATA ON FOLI	LOWING	LINE	*****		GW046 00603
4-Methyl-2-pentanone (MIBK)	ND		10	ug/L	SW846 8260A

## GC/MS Volatiles

Client Lot #: A8E110118	Work Order #: CHD4R101	Matrix WATER
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		REPORTIN	NG		
PARAMETER	RESULT	LIMIT	UNITS	METHOD	
Propionitrile	ND	4.0	ug/L	SW846 8260A	
Styrene	ND	1.0	ug/L	SW846 8260A	
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260A	
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260A	
Tetrachloroethene	ND	1.0	ug/L	SW846 8260A	
Toluene	ND	1.0	ug/L	SW846 8260A	
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260A	
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260A	
Trichloroethene	ND	1.0	ug/L	SW846 8260A	
Trichlorofluoromethane	ND	2.0	ug/L	SW846 8260A	
1,2,3-Trichloropropane	ND	1.0	ug/L	SW846 8260A	
Vinyl acetate	ND .	2.0	ug/L	SW846 8260A	
Vinyl chloride	ND	2.0	ug/L	SW846 8260A	
Xylenes (total)	ND	1.0	ug/L	SW846 8260A	
m-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A	
p-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A	
o-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A	
	PERCENT	RECOVER	Y		
SURROGATE	RECOVERY	LIMITS			
1,2-Dichloroethane-d4	94	(69 - 1	-		
Toluene-d8	106	(90 - 1	12)		
Bromofluorobenzene	110	(87 - 1	14)		

NOTE(S):

## GC/MS Volatiles

Client Lot #...: A8E110118

Work Order #...: CH6CN101

Matrix....: WATER

MB Lot-Sample #: A8E140000-287

Prep Date....: 05/14/98

Analysis Date..: 05/14/98

Prep Batch #...: 8134287

Dilution Factor: 1

(MIBK)

REPORTING

		REPORTIT		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
PARAMETER	RESULT	LIMIT	UNITS	METHOD
Acetone	ND	10	ug/L	SW846 8260A
Acetonitrile	ND	20	ug/L	SW846 8260A
Acrolein	ND	20	ug/L	SW846 8260A
Acrylonitrile	ND	20	ug/L	SW846 8260A
Allyl chloride	ND	2.0	ug/L	SW846 8260A
Benzene	ND	1.0	ug/L	SW846 8260A
Bromodichloromethane	ND	1.0	ug/L	SW846 8260A
Bromoform	ND	1.0	ug/L	SW846 8260A
Bromomethane	ND	2.0	ug/L	SW846 8260A
2-Butanone (MEK)	ND	10	ug/L	SW846 8260A
Carbon disulfide	ND	1.0	ug/L	SW846 8260A
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260A
Chlorobenzene	ND	1.0	ug/L	SW846 8260A
loroethane	ND	2.0	ug/L	SW846 8260A
nloroform	ND	0.25	ug/L	SW846 8260A
Chloromethane	ND	2.0	ug/L	SW846 8260A
Chloroprene	ND .	1.0	ug/L	SW846 8260A
Dibromochloromethane	ND	1.0	ug/L	SW846 8260A
1,2-Dibromo-3-chloro- propane	ND	2.0	ug/L	SW846 8260A
1,2-Dibromoethane (EDB)	ND	1.0	ug/L	SW846 8260A
Dibromomethane	ND	1.0	ug/L	SW846 8260A
trans-1,4-Dichloro- 2-butene	ND	5.0	ug/L	SW846 8260A
Dichlorodifluoromethane	ND	2.0	ug/L	SW846 8260A
1,1-Dichloroethane	ND ·	1.0	ug/L	SW846 8260A
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260A
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260A
trans-1,2-Dichloroethene	ND	0.50	ug/L	SW846 8260A
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260A
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260A
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260A
Ethylbenzene	ND	1.0	ug/L	SW846 8260A
Ethyl methacrylate	ND	1.0	ug/L	SW846 8260A
2-Hexanone	ND	10	ug/L	SW846 8260A
Iodomethane	ND	1.0	ug/L	SW846 8260A
	ND	40	ug/L	SW846 8260A
Isobutyl alcohol	ND	10	ug/L	SW846 8260A
Methacrylonitrile	ND	1.0	ug/L	SW846 8260A
ethylene chloride	ND	1.0	ug/L	SW846 8260A
thyl methacrylate 4-Methyl-2-pentanone	ND	5.0	ug/L	SW846 8260A

# GC/MS Volatiles

Client Lot #: A8E110118	Work Order #: CH6CN101	Matrix WAIER
(   Jell   S) + + + + + VONTTACTAC		

		REPORTI	NG	
PARAMETER	RESULT	LIMIT	UNITS	METHOD
Propionitrile	ND	4.0	ug/L	SW846 8260A
	ND	1.0	ug/L	SW846 8260A
Styrene 1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260A
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260A
Tetrachloroethene	ND	1.0	ug/L	SW846 8260A
	ND	1.0	ug/L	SW846 8260A
Toluene 1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260A
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260A
Trichloroethene	ND	1.0	ug/L	SW846 8260A
Trichlorofluoromethane	ND	2.0	ug/L	SW846 8260A
	ND	1.0	ug/L	SW846 8260A
1,2,3-Trichloropropane	ND	2.0	ug/L	SW846 8260A
Vinyl acetate	ND	2.0	ug/L	SW846 8260A
Vinyl chloride	ND	1.0	ug/L	SW846 8260A
Xylenes (total)	ND	1.0	ug/L	SW846 8260A
m-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A
p-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A
o-Dichlorobenzene	ND		3.	
	PERCENT	RECOVERY		1 - Fa 1 - Fa 1
***************************************	RECOVERY	LIMITS		
SURROGATE	88	(69 - 1	L27)	
1,2-Dichloroethane-d4	98	(90 - 3		
Toluene-d8 Bromofluorobenzene	92	(87 - 3		

NOTE (S):

## GC Semivolatiles

Client Lot #...: A8E110118 Work Order #...: CH3NF101 Matrix.....: SOLID

MB Lot-Sample #: A8E120000-107

Prep Date...: 05/12/98
Analysis Date..: 06/03/98
Prep Batch #...: 8132107

Dilution Factor: 1

REPORTING

PARAMETER RESULT LIMIT UNITS METHOD
Hexachlorobenzene ND 3.3 ug/kg SW846 8081A

 SURROGATE
 RECOVERY

 Tetrachloro-m-xylene
 98
 (8.0- 129)

 Decachlorobiphenyl
 188 \*
 (0.0- 138)

NOTE(S):

<sup>\*</sup> Surrogate recovery is outside stated control limits.

## GC Semivolatiles

Client Lot # ...: A8E110118

Work Order #...: CH58X101

Matrix....: WATER

MB Lot-Sample #: A8E130000-254

Prep Date....: 05/13/98

Analysis Date..: 06/01/98 Prep Batch #...: 8133254

Dilution Factor: 1

REPORTING

PARAMETER	RESULT	LIMIT	UNITS	METHOD	_
Hexachlorobenzene	ND	0.050	ug/L	SW846 8081A	

 SURROGATE
 RECOVERY
 LIMITS

 Tetrachloro-m-xylene
 67
 (10 - 130)

 Decachlorobiphenyl
 69
 (10 - 116)

NOTE (S):

#### GC Semivolatiles

Client Lot #...: A8E110118

Work Order #...: CHFPP101

Matrix....: SOLID

MB Lot-Sample #: A8E270000-142

Prep Date....: 05/27/98

Analysis Date..: 05/28/98 Prep Batch #...: 8147142

Dilution Factor: 1

RE	PO	RT	IN	G

PARAMETER	RESULT	LIMIT	UNITS	METHOD
Aroclor 1016	ND	1.0	mg/kg	SW846 8082
Aroclor 1221	ND	1.0	mg/kg	SW846 8082
Aroclor 1232	ND	1.0	mg/kg	SW846 8082
Aroclor 1242	ND	1.0	mg/kg	SW846 8082
Aroclor 1248	ND	1.0	mg/kg	SW846 8082
Aroclor 1254	ND	1.0	mg/kg	SW846 8082
Aroclor 1260	ND	1.0	mg/kg	SW846 8082
	PERCENT	RECOVER	Y	
SURROGATE	RECOVERY	LIMITS		
Tetrachloro-m-xylene	122	(8.0- 129)		
Decachlorobiphenyl	119	(0.0- 1	38)	

TR (S) :

### GC Semivolatiles

Client Lot # ...: A8E110118

Work Order #...: CH4JG101

Matrix....: WATER

MB Lot-Sample #: A8E130000-104

Prep Date....: 05/13/98 Prep Batch #...: 8133104

Analysis Date..: 05/22/98

Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHO	0
Aroclor 1016	ND	1.0	ug/L	SW846	8082
Aroclor 1221	ND	1.0	ug/L	SW846	8082
Aroclor 1232	ND	1.0	ug/L	SW846	8082
Aroclor 1242	ND	1.0	ug/L	SW846	8082
Aroclor 1248	ND	1.0	ug/L	SW846	8082
Aroclor 1254	ND	1.0	ug/L	SW846	8082
Aroclor 1260	ND	1.0	ug/L	SW846	8082
	PERCENT	RECOVERY			
SURROGATE	RECOVERY	LIMITS	_		
Tetrachloro-m-xylene	82	(10 - 130	)		
Decachlorobiphenyl	79	(10 - 116	)		

TE(S):

alculations are performed before rounding to avoid round-off errors in calculated results.

### GC Semivolatiles

Client Lot # ...: A8E110118

Work Order #...: CH5JF101

Matrix..... SOLID

MB Lot-Sample #: A8E140000-157

Prep Date....: 05/14/98

Analysis Date..: 05/28/98 Prep Bat

Prep Batch #...: 8134157

Dilution Factor: 1

REPORTING

	REPORTING			
RESULT	LIMIT	UNITS	METHOD	
ND	33	ug/kg	SW846 8082	
ND	33	ug/kg	SW846 8082	
ND	33	ug/kg	SW846 8082	
ND	33	ug/kg	SW846 8082	
	33	ug/kg	SW846 8082	
	33	ug/kg	SW846 8082	
ND	33	ug/kg	SW846 8082	
PERCENT	RECOVER	Y		
RECOVERY	LIMITS			
90	(8.0- 1	29)		
100	(0.0- 1	38)		
	ND N	RESULT         LIMIT           ND         33           PERCENT         RECOVERY           90         (8.0-1)	RESULT   LIMIT   UNITS   ug/kg   ND   33   ug/kg   PERCENT   RECOVERY   RECOVERY   LIMITS   ELIMITS   ELIMITS	

TR(S)

alculations are performed before rounding to avoid round-off errors in calculated results.

### GC Semivolatiles

Client Lot #...: A8E110118

Work Order #...: CH3NG101

Matrix....: SOLID

MB Lot-Sample #: A8E120000-108

Prep Date....: 05/12/98 Prep Batch #...: 8132108

Analysis Date..: 05/27/98

Dilution Factor: 1

REPORTING

	RESULT	LIMIT	UNITS	METHOD
PARAMETER	ND	33	ug/kg	SW846 8082
Aroclor 1016		33	ug/kg	SW846 8082
Aroclor 1221	ND			SW846 8082
Aroclor 1232	ND	33	ug/kg	
Aroclor 1242	ND	33	ug/kg	SW846 8082
Aroclor 1248	ND	33	ug/kg	SW846 8082
Aroclor 1254	ND	33	ug/kg	SW846 8082
Aroclor 1260	ND	33	ug/kg	SW846 8082
	PERCENT	RECOVER	Y	
SURROGATE	RECOVERY	LIMITS		
Tetrachloro-m-xylene	82	(8.0- 1		
Decachlorobiphenyl	93	(0.0- 1	38)	

TE(S):

## TOTAL Metals

Client Lot # ...: A8E110118

Matrix..... WATER

REPORTING

PREPARATION- WORK

PARAMETER RESULT

LIMIT UNITS METHOD

ANALYSIS DATE ORDER #

MB Lot-Sample #: A8E120000-253 Prep Batch #...: 8132253 Cobalt

ND

7.0 ug/L SW846 6010A 05/13-05/18/98 CH4EA101

Dilution Factor: 1

NOTE (S):

### METHOD BLANK REPORT

### TOTAL Metals

Client Lot # ...: A8E110118

Matrix....: SOLID

PREPARATION- WORK REPORTING ANALYSIS DATE ORDER # LIMIT UNITS METHOD PARAMETER RESULT MB Lot-Sample #: A8E150000-119 Prep Batch #...: 8135119

SW846 6010A 5000 ug/kg ND Cobalt

Dilution Factor: 1

05/15-05/18/98 CH6F4101

NOTE (S):

### METHOD BLANK REPORT

### General Chemistry

Client Lot # ...: A8E110118

Matrix..... SOLID

 REPORTING
 PREPARATION- PREP

 PARAMETER
 RESULT
 LIMIT
 UNITS
 METHOD
 ANALYSIS DATE
 BATCH #

 Percent Solids
 Work Order #: CH3P0101
 MB Lot-Sample #: A8E120000-118
 A8E120000-118
 MCAWW 160.3 MOD
 05/12-05/13/98
 8132118

Dilution Factor: 1

NOTE (S):

### METHOD BLANK REPORT

### General Chemistry

Client Lot #...: A8E110118

Matrix..... WATER

PARAMETER Amenable Cyanide	RESULT ND	REPORTING LIMIT Work Order 0.010 ution Factor: 1	#: CHC8E101 mg/L	METHOD  MB Lot-Sample #: SW846 9012	PREPARATION- ANALYSIS DATE A8E210000-163 05/21/98	PREP BATCH # 8141163
Dissolved Cyanide	ND		#: CHC8E101 mg/L	MB Lot-Sample #: SW846 9012	A8E210000-163 05/21/98	8141163
Total Cyanide	ND Dil	Work Order 0.010 ution Factor: 1	#: CHC8E101 mg/L	MB Lot-Sample #: SW846 9012	A8E210000-163 05/21/98	8141163

NOTE (S):

### GC/MS Volatiles

Client Lot #...: A8E110118 Work Order #...: CH3A2104-MS Matrix....: WATER

MS Lot-Sample #: A8E110118-003 CH3A2105-MSD

1.34

Date Sampled...: 05/08/98 10:26 Date Received..: 05/09/98 Prep Date....: 05/14/98 Analysis Date..: 05/14/98

Prep Batch #...: 8134287

Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOI	0
Benzene	94	(78 - 117)	-		SW846	8260A
Delizerie	93	(78 - 117)	1.3	(0-17)	SW846	8260A
Chlorobenzene	103	(81 - 115)			SW846	8260A
CIII OI OD CIII CII C	102	(81 - 115)	1.4	(0-18)	SW846	8260A
1.1-Dichloroethene	96	(75 - 113)			SW846	8260A
I, I Didilolocollollo	94	(75 - 113)	2.1	(0-20)	SW846	8260A
Toluene	97	(78 - 126)			SW846	8260A
Tordene	94	(78 - 126)	2.3	(0-24)	SW846	8260A
Trichloroethene	98	(71 - 110)			SW846	8260A
111011010concinc	97	(71 - 110)	1.2	(0-22)	SW846	8260A
		PERCENT		RECOVERY		
ROGATE		RECOVERY		LIMITS		
1,2-Dichloroethane-d4	_	87		(69 - 12	7)	
1,2-Dichiolocchanc al		81		(69 - 12	7)	
Toluene-d8		94		(90 - 11:	2)	
TOTUETIE-40		95		(90 - 11	2)	
Bromofluorobenzene		85 *		(87 - 11	4)	
BLOMOTIGOTODENZENE		82 *		(87 - 11	4)	

NOTE (S):

<sup>\*</sup> Surrogate recovery is outside stated control limits.

### GC/MS Volatiles

Client Lot #...: A8E110118 Work Order #...: CH6GF105-MS Matrix.....: WATER

MS Lot-Sample #: A8E150103-015 CH6GF106-MSD

Date Sampled...: 05/13/98 09:25 Date Received..: 05/14/98 Prep Date....: 05/21/98 Analysis Date..: 05/21/98

Prep Batch #...: 8141316 Dilution Factor: 5000

PARAMETER	PERCENT	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
	99	(75 - 113)		-	SW846 8260B
1,1-Dichloroethene	110	(75 - 113)	10	(0-20)	SW846 8260B
Trichloroethene	91	(71 - 110)			SW846 8260B
Trichtoroethene	92	(71 - 110)	0.83	(0-22)	SW846 8260B
of I amakamana	101	(81 - 115)			SW846 8260B
Chlorobenzene	102	(81 - 115)	1.5	(0-18)	SW846 8260B
	104	(78 - 126)			SW846 8260B
Toluene	105	(78 - 126)	0.89	(0-24)	SW846 8260B
and the second s	99	(78 - 117)			SW846 8260B
Benzene	100	(78 - 117)	0.80	(0-17)	SW846 8260B

	PERCENT	LIMITS
RROGATE		(80 - 120)
1,2-Dichloroethane-d4	93	
=/-	95	(80 - 120)
Toluene-d8	108	(88 - 110)
Toluene-do	106	(88 - 110)
Bromofluorobenzene	113	(86 - 115)
BIOMOTIGOTOSCIISCIIC	112	(86 - 115)
Dibromofluoromethane	102	(86 - 118)
DIDIOMOLICOLOMO	102	(86 - 118)

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

### TOTAL Metals

Client Lot #...: A8E110118 Matrix....: WATER

Date Sampled...: 05/05/98 08:45 Date Received..: 05/06/98

PERCENT RECOVERY RPD PREPARATION- WORK

PARAMETER RECOVERY LIMITS RPD LIMITS METHOD ANALYSIS DATE ORDER #

ES Lot-Sample #: A8E060157-012 Prep Batch #...: 8132253

Cobalt 97 (80 - 120) SW846 6010A 05/13-05/18/98 CGXXT106

96 (80 - 120) 0.96 (0-20) SW846 6010A 05/13-05/18/98 CGXXT107

Dilution Factor: 1

NOTE (S):

### TOTAL Metals

Matrix....: SOLID Client Lot # ...: A8E110118 Date Sampled...: 05/05/98 13:55 Date Received..: 05/06/98 PREPARATION-WORK RPD PERCENT RECOVERY ANALYSIS DATE ORDER # RECOVERY LIMITS RPD LIMITS METHOD PARAMETER MS Lot-Sample #: A8E060157-018 Prep Batch #...: 8135119 05/15-05/18/98 CH00G104 (80 - 120) SW846 6010A 109 Cobalt (80 - 120) 36 (0-20) SW846 6010A 05/15-05/18/98 CH00G105 48 N,\*

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Dilution Factor: 1

Results and reporting limits have been adjusted for dry weight.

N Spiked analyte recovery is outside stated control limits.

\* Relative percent difference (RPD) is outside stated control limits.

## TOTAL Metals

Client Lot #	: A8E11	Matrix	SOLID			
PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS RPD	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sampl Cobalt	le #: A8E06 92 95	(80 - 120) (80 - 120) 3.1 Dilution Factor:	(0-20)	SW846 6010A	05/15-05/18/98 05/15-05/18/98	

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

## General Chemistry

Client Lot #...: A8E110118

Date Sampled...: 05/07/98 10:10 Date Received..: 05/08/98

PARAMETER	PERCENT	RECOVERY LIMITS	RPD LIMITS ME	THOD	PREPARATION- ANALYSIS DATE	
Dissolved Cya		WO#: (70 - 130)	0.28 (0-20) SW	D711U-MSD MS 846 9012 846 9012	S Lot-Sample #: A 05/21/98 05/21/98	8141163 8141163
Total Cyanide	75 74	(70 - 130)	1.1 (0-20) SW	DH10W-MSD MS 846 9012 846 9012	05/21/98 05/21/98	8141163 8141163

NOTE (S):

### SAMPLE DUPLICATE EVALUATION REPORT

### General Chemistry

Client Lot #...: A8E110118 Work Order #...: CH3AL-SMP Matrix.....: SOLID

CH3AL-DUP

Date Sampled...: 05/08/98 09:40 Date Received..: 05/09/98

\* Moisture....: 12

Dilution Factor: 1

#### MOTO (C)

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

#### SAMPLE DUPLICATE EVALUATION REPORT

### General Chemistry

Matrix....: SOLID Work Order #...: CH35Q-SMP Client Lot # ...: A8E110118

CH35Q-DUP

Date Sampled...: 05/08/98 15:33 Date Received..: 05/11/98

% Moisture....: 15 PREPARATION-PREP RPD DUPLICATE ANALYSIS DATE BATCH #

LIMIT METHOD UNITS RPD RESULT PARAM RESULT SD Lot-Sample #: A8E110105-001

Percent Solids 05/12-05/13/98 8132118 0.007 (0-20) MCAWW 160.3 MOD ક 85.5 85.5

Dilution Factor: 1

### NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

# Chain of stody Record



QUA-4149-1						-			_			- 1
3M Company			Project Manager  Date  Date  Telephone Number (Area Code)/Fax Number  Lab Jocali					May 7-8, 1998	F	age_	1 0	
Address 935 Bush AVE.			Telephone Number	1	- 5381	7		North Conton, OH		9	Analy	/sls
City State MA	Zip Code 55144	-1000	Site Contact	ol 5m	yder					A Ch		
Project Number/Name  OR DOVA RFI  Contract/Purchase Order/Quote Number	m 1997	1	Carrier Waybill Nu		8005	40	75 18	74	100	SZ CO M		
				Coi	ntainers			0 50 50	HCB -	Voc3 -		
Sample I.D. Number and Description	Date	Time	Sample Type	Volume	Туре	No.	Preservative	Condition on Receipt/Comments	1	43		
RFI-I (TIES) MH3-94	5/7/98	17:53	Water	1 Lita	AMBER	2	HONE	1	X	,		
•	1	+	1	250ml	PLASTIC	1	NaOH	Hold	()			
RFI-I (RIS) MWI-88	5 7 91	1:44		ILitar	MABER	2	HONE	it.	X	/		
<b>\</b>	1	4		250~	PLACTIC	1	NaoH	Ho 1	1,1	4		
TRFI-I (RES) MU8-90	5 1/99	10:26		ILdu	AMPLL	2	Nan	111	X	,	++++	
<b>*</b>	1	1		250ml	PLASTIC	1	Naolt	Hold	1-1	0		
Field Delicate #4	5/8/97	10:24		40 ml	GLASS	3	HCI			X		
RFI-I (RES) MU9-90	3/8/97	10:24		40-1	61355	3	HCI		-	- <del> X </del> -		
RFI-I (REG)MH8-90 MSMID	8 5/9/18	10:24		40ml	GLASS	3	Hel		- 0	_X_	++++	
TOUISMENT BLANK #3	5/1/98	11:19		1 Liter	AMBEL	2	NONE		X			
1	1	1		250ml	PLASTIC	1	NaOH				1-1-1-	
•	1	4		4001	61ASS	3	HCI		-	X		
Field Blank =5	51 98	11:42		1 Liter	MMER	2	NONE		X	,		
		1		250W	PLASTIC	1	NaOH	Hold	112			
<u> </u>	Ψ.	V		40 ml	GLASS	3	HCI		1	X		
TRIP BLANK	5/8/98	-		40 ml	bLASS	3	Hel			X		
Special Instructions Truycutuc Blank	5/8/98		V		Rustic	1	HOME	FORTINI. MCASULCHON	70	NUT		
Possible Hazard Identification	uin teritant	Poison &	B Unkno	Sample Disp	osal n To Client	X	isposal By Lab	Archive For Month:	(A fe	e may ined lo	be assessed if a	samples are
Turn Around Time Required	kin Irritant L	a roison t	OC Level As	per workpl			Requirements (	(Specify)				
Normal Rush C	ther		Date	Time   13: (-	1. Receiv	ved By				D	ale	Time
2. Relinquished By		-	5/1/97 Date	Time	2. Recei	ved By				D	ale	Time
. 0						. /	1					
3. Relinquished By			Date	Time	3. Rece	ed By	. di			5	19/58	9:45-
DISTRIBUTION: WHITE - Stays with the Sample; Co	142641		432.86	K - Field Copy				Type at 14°C When &	240	o ipri	into slipe	at

# Chain of ustody Record





DUA-4149-1 Client			Project Manager					Man Q	1998		age _	1	of_	1	
3M- Cordova IL			John Hunter				10	May 8	North	-	ago _	0			
Address			1 Page 18 18 18 18 18 18 18 18 18 18 18 18 18					Quanterra,	Conton	0	V	0	Analys	ls	
935 BUSH AVENUE			612-	012 770				X44401114	CHIPCON	O	101	113	TIT		
City State Z	p Code	1	Carrier Waybill Nur	c. 1	5					W.	000	6/4			
St. Paul MN	5144-	1000	Carrie Wantill Nur	JAY &	6h					4	100	0			
Cordova RFI. Ma	4 19	98	FED I	Ex: 80	105-1	102	5-18	63		10/0	8 8080A	o dw			
Contract/Purchase Order Quote Number	0	,								19	OU	2			
		Time	Sample Type	Con	tainers		Preservative	Condition on Re	ceipt/Comments	H3	9EC	-		11	
Sample I.D. Number and Description	Date			Volume	Туре	No.	41			+	+	1	+++	++	11:1
Tr-protore Black 55-5/8 3	5-8 98	-	Wate!	40 ~1	Plastic		None				X I	/		+	111
RFI-1 (RES) 55-8		0800	50:1	120 -1	61-55	3	None					4-		1	
Field Blank II		0512	Voter	1 eter	Plastic	1	HNO			1-1	V	X -		1	1
11 11		0812				2	None			-1-1	X	X -			
(RFI-1 (RES) 55.9		0900	Seil	120 ml	61435	3	1			11	X	K			
RFI-1 (RES) 55-6		0900				1					X	X			
RFI-1 (RES) 55-6	Ψ	0940	V	Y	Y	.Y									
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-														1	111
		-									1	11			
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Special Instructions				41	_	,	-	1 4	K12 - 77	g	5-25	0	~/a.	+	Linu
Special Instructions  Coll Cathy Laison  Possition Hazard Identification  Non-Hazard Flammable Skin in	t 61	2 - 5	51-247	4 01	Co	101	2449	16/ 45	0/2 7/1			v bo oc	corend it e	amolas	are
Possible lazard Identification		7		Sample Dispo	osal	V.		Archive For	Monti	A ret	iee ma ained l	onger th	an 3 mont	hs)	aro
Non-Hazard Flammable Skin	rritant	Poison	B Unkno	wn Return	To Client	Specific	o Bequirements	Archive For		-					
Turn Around Time Required			OC Level 50	e Weik	Tan Pioject	5-6	> 3 M.	· Cardova -	RFT I	10	rk	P/0	4		
Normal Bush Olhe			Data .	Time	1. Receiv	ed By	0	-07.11.04		,	1	Date		Time	
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111 2			13/8/7	3 125 S	2. Receiv	red By						Date		Time	
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000			Date	Time	3. R. C)	red By	11	0				Date /	. /	Time	
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# CORDOVA RFI

# MAY 1998 ANALYTICAL REPORT

LOT #: A8E070151



Quanterra Incorporated 4101 Shuffel Drive, NW North Canton, Ohio 44720

330 497-9396 Telephone 330 497-0772 Fax

# ANALYTICAL REPORT

CORDOVA RFI MAY 1998

Lot #: A8E070151

Carol Snyder

3M Company

QUANTERRA INCORPORATED

Jeffrey C. Smith Project Manager

June 15, 1998

# CASE NARRATIVE

The following report contains the analytical results for ten water samples and eight solid samples submitted to Quanterra-North Canton by 3M Company from the Cordova RFI May 1998 Site. The samples were received May 7, 1998 according to documented sample acceptance procedures.

Quanterra-North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided by facsimile transmission to Carol Snyder on June 4, 1998.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

The coolers were received at the laboratory at temperatures of 0.5, 0.6, 0.4, and 1.5° C.

# SUPPLEMENTAL QC INFORMATION

# GC SEMIVOLATILES - Organochlorine Pesticides

Sample RFI-I (RES) SS-3 was diluted due to matrix effects and was ND; therefore, the detection limites were elevated.

# GC SEMIVOLATILES - Polychlorinated Biphenyls

Samples RFI-I (RES) SS-5, RFI-I (RES) SS-12, RFI-I (RES) SS-13, RFI-I (RES) SS-14, RFI-I (RES) SS-17, RFI-I (RES) SS-18, and RFI-I (RES) SS-3 were diluted due to matrix effects and was ND; therefore, the detection limits were elevated.

### METALS

Matrix spike/spike duplicate spike recoveries were outside the acceptance limits for some analytes. The acceptable laboratory control sample analysis data indicated that the analytical system was operating within control and this condition is most likely due to matrix interference. See the Matrix Spike Report for the affected analytes which will be flagged with "N".

Matrix spike/spike duplicate relative percent difference (RPD) exceeded the acceptance limits for some analytes. The imprecision may be attributed to sample heterogeneity. See the Matrix Spike Report for the affected analytes which will be flagged with "\*".

# ANALYTICAL METHODS SUMMARY

### A8E070151

PARAMETER	METHOD
Inductively Coupled Plasma (ICP) Metals	SW846 6010A SW846 8081A
Organochlorine Pesticides	SW846 8082
PCBs Total Residue as Percent Solids	MCAWW 160.3 MOD
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010A

### References:

MCAWW	"Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.
SW846	"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

#### A8R070151

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CH10J	001	RFI-I (RES) MW9-90	05/06/98 05/06/98	
CH10M CH10N	002	RFI-I (RES) MW4-94 FIELD DUPLICATE #2	05/06/98	11:57
CH10N	004	RFI-I (RES) MW7-90	05/06/98 05/06/98	
CH10Q	005	FIELD DUPLICATE #3 RFI-I (RES) MW4-90	05/06/98	
CH10R CH11C	007	FIELD BLANK #3	05/06/98 05/06/98	
CH11J	800	RFI-I (RES) SS-5 RFI-I (RES) SS-12	05/06/98	
CH11W CH124	009	RFI-I (RES) SS-16	05/06/98	
CH127	011	FIELD BLANK #9	05/06/98 05/06/98	
CH128	012	RFI-I (RES) SS-13 RFI-I (RES) SS-14	05/06/98	
CH12A	014	RFI-I (RES) SS-17	05/06/98 05/06/98	
CH12C CH12D	015 016	RFI-I (RES) SS-18 RFI-I (RES) SS-3	05/06/98	

NOTE (S):

calculations are performed before rounding to avoid round-off errors in calculated results.

results noted as "ND" were not detected at or above the stated limit.

<sup>-</sup> The analytical results of the samples listed above are presented on the following pages.

<sup>-</sup> This report must not be reproduced, except in full, without the written approval of the laboratory.

<sup>-</sup> Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH. porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# Client Sample ID: RFI-I (RES) MW9-90

### GC Semivolatiles

Lot-Sample #: A8E070151-001 Date Sampled: 05/06/98 10:22 Prep Date: 05/12/98	Work Order #: Date Received: Analysis Date:	05/07/98	Matrix: WATER
Prep Batch #: 8132112 Dilution Factor: 1	Method:	SW846 8081A	
PARAMETER Hexachlorobenzene	RESULT ND	22	NITS
SURROGATE Tetrachloro-m-xylene	PERCENT RECOVERY 52 67	RECOVERY LIMITS (10 - 130) (10 - 116)	

# Client Sample ID: RFI-I (RES) MW4-94

### GC Semivolatiles

Lot-Sample #: A8E070151-002 Date Sampled: 05/06/98 11:57 Prep Date: 05/12/98	Work Order #: Date Received: Analysis Date:	05/07/98	Matrix: WATER
Prep Batch #: 8132112 Dilution Factor: 1	Method:	SW846 8081A	
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 0.050	UNITS ug/L
SURROGATE Tetrachloro-m-xylene	PERCENT RECOVERY 29	RECOVERY LIMITS (10 - 130)	

(10 - 116)

41

Tetrachloro-m-xylene

## Client Sample ID: FIELD DUPLICATE #2

### GC Semivolatiles

Lot-Sample #: A8E070151-003 Date Sampled: 05/06/98 11:57 Prep Date: 05/12/98 Prep Batch #: 8132112	Work Order #: Date Received: Analysis Date:	05/07/98	Matrix: WATER
Dilution Factor: 1	Method:	SW846 8081	A
PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS	
Tetrachloro-m-xylene	50	(10 - 130)	

(10 - 116)

66

# Client Sample ID: RFI-I (RES) MW7-90

# GC Semivolatiles

Lot-Sample #: A8E070151-004 Date Sampled: 05/06/98 14:07 Prep Date: 05/12/98	Work Order #: Date Received: Analysis Date:	05/07/98	Matrix: WATER
Prep Batch #: 8132112 Dilution Factor: 1	Method:	SW846 8081	A
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 0.050	UNITS ug/L
SURROGATE Tetrachloro-m-xylene	PERCENT RECOVERY 58	RECOVERY LIMITS (10 - 130)	

68

Decachlorobiphenyl

(10 - 116)

# Client Sample ID: FIKLD DUPLICATE #3

### GC Semivolatiles

Lot-Sample #: A8E070151-005 Date Sampled: 05/06/98 14:07 Prep Date: 05/12/98 Prep Batch #: 8132112	Work Order #: Date Received: Analysis Date:	05/07/98
Dilution Factor: 1	Method:	SW846 8081A
PARAMETER	RESULT	REPORTING LIMIT UNITS
Hexachlorobenzene	ND	0.050 ug/L
SURROGATE	PERCENT RECOVERY	RECOVERY
Tetrachloro-m-xylene Decachlorobiphenyl	54 60	(10 - 130) (10 - 116)

# Client Sample ID: RFI-I (RES) MW4-90

### GC Semivolatiles

- CHI OPI 03

Date Sampled: A8E070151-006  Date Sampled: 05/06/98 15:40  Prep Date: 05/12/98	Date Received: Analysis Date:	05/07/98	
Prep Batch #: 8132112 Dilution Factor: 1	Method:	SW846 8081A	
PARAMETER	RESULT		NITS
Hexachlorobenzene	ND	0.050 ug	l/r
		PECOVERY	

 SURROGATE
 PERCENT
 RECOVERY

 Tetrachloro-m-xylene
 80
 (10 - 130)

 Decachlorobiphenyl
 148 \*
 (10 - 116)

NOTE (S):

<sup>\*</sup> Surrogate recovery is outside stated control limits.

# Client Sample ID: FIKLD BLANK #3

## GC Semivolatiles

Lot-Sample #: A8E070151-007 Date Sampled: 05/06/98 16:04 Prep Date: 05/12/98 Prep Batch #: 8132112	Work Order #: Date Received: Analysis Date:	05/07/98	Matrix WATER
Dilution Factor: 1	Method:	SW846 80812	Α ·
PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS	
Tetrachloro-m-xylene Decachlorobiphenyl	55 68	(10 - 130) (10 - 116)	

# Client Sample ID: RFI-I (RES) SS-5

### GC Semivolatiles

Lot-Sample #: A8E070151-008 Date Sampled: 05/06/98 09:00 Prep Date: 05/12/98 Prep Batch #: 8132107	Work Order #: Date Received: Analysis Date:	05/07/98	Matrix: SOLID
Dilution Factor: 10 % Moisture: 12	Method:	SW846 8081	A
PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	52	38	ug/kg
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS	
Tetrachloro-m-xylene Decachlorobiphenyl	0.0 DIL,* 141 DIL,*	(8.0- 129) (0.0- 138)	

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

## Client Sample ID: RFI-I (RES) SS-5

### GC Semivolatiles

Tot-Sample # . A8E070151-0	08 Work Order #: CH11J102	Matrix: SOLID
Tot-Sample # : A8E0/0151-0	8 MOLK OLDER # CHILLDED	

Date Sampled...: 05/06/98 09:00 Date Received..: 05/07/98 Prep Date....: 05/12/98 Analysis Date..: 05/29/98

Prep Batch #...: 8132108

Dilution Factor: 10

\* Moisture....: 12 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT UNITS
Aroclor 1016	ND	380 ug/kg
Aroclor 1221	ND .	380 ug/kg
Aroclor 1232	ND	380 ug/kg
Aroclor 1242	ND	380 ug/kg
Aroclor 1248	ND	380 ug/kg
Aroclor 1254	ND	380 ug/kg
Aroclor 1260	ND	380 ug/kg
	PERCENT	RECOVERY
SURROGATE	RECOVERY	LIMITS
Tetrachloro-m-xylene	41 DIL	(8.0- 129)
Decachlorobiphenyl	53 DIL	(0.0- 138)

### NOTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

# Client Sample ID: RFI-I (RES) SS-12

### GC Semivolatiles

Tot-Sample #:	A8E070151-009	Work Order #: 0	H11W103	Matrix SOLID
Date Sampled:	05/06/98 09:30	Date Received: 0	5/07/98	
Prep Date:	05/13/98	Analysis Date 0	06/02/98	

Prep Date....: 05/13/98 Prep Batch #...: 8133101

Dilution Factor: 20

\* Moisture....: 9.5 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	730	ug/kg
Aroclor 1221	ND	730	ug/kg
Aroclor 1232	ND	730	ug/kg
Aroclor 1242	ND	730	ug/kg
Aroclor 1248	ND	730	ug/kg
Aroclor 1254	ND	730	ug/kg
Aroclor 1260	ND	730	ug/kg
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	-
Tetrachloro-m-xylene	153 DIL,*	(8.0- 129)	
Decachlorobiphenyl	269 DIL,*	(0.0- 138)	)

### OTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight,

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

Client Sample ID: RFI-I (RES) SS-12

### TOTAL Metals

Matrix....: SOLID Lot-Sample #...: A8E070151-009

Date Sampled...: 05/06/98 09:30 Date Received..: 05/07/98

\* Moisture....: 9.5

PREPARATION-WORK REPORTING ANALYSIS DATE ORDER # METHOD LIMIT UNITS

PARAMETER RESULT

Prep Batch #...: 8135119

05/15-05/18/98 CH11W102 SW846 6010A 5530 ug/kg 75300 Cobalt

Dilution Factor: 1

NOTE (S): Results and reporting limits have been adjusted for dry weight.

# Client Sample ID: RFI-I (RES) SS-16

### GC Semivolatiles

Tat Cample # .	A8E070151-010	Work Order	#:	CH124103	Matrix Solid
Por-pampre #	11000,000		_	/ /	

Date Sampled...: 05/06/98 10:30 Date Received..: 05/07/98
Prep Date....: 05/13/98 Analysis Date..: 05/26/98

Prep Batch #...: 8133101

Dilution Factor: 1 % Moisture....: 7.2

Method....: SW846 8082

RESULT	REPORTING LIMIT	UNITS ug/kg
ND		
ND	36	ug/kg
	36	ug/kg
	36	ug/kg
ND		877
PERCENT	RECOVERY	
RECOVERY		The second second
100	(8.0- 129	)
147 *	(0.0- 138	
	ND ND ND ND ND S6 ND PERCENT RECOVERY	RESULT   LIMIT

#### NOTE (S):

Results and reporting limits have been adjusted for dry weight.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

# Client Sample ID: RFI-I (RES) SS-16

### TOTAL Metals

Matrix....: SOLID Lot-Sample #...: A8E070151-010

Date Sampled...: 05/06/98 10:30 Date Received..: 05/07/98

\* Moisture....: 7.2

PREPARATION-REPORTING ANALYSIS DATE ORDER # LIMIT UNITS METHOD

PARAMETER RESULT

Prep Batch #...: 8135119 05/15-05/18/98 CH124102 SW846 6010A 5390 ug/kg 28900 Cobalt

Dilution Factor: 1

NOTE (S):

Results and reporting limits have been adjusted for dry weight.

# Client Sample ID: FIELD BLANK #9

## GC Semivolatiles

Lot-Sample #: A8E070151-011 Date Sampled: 05/06/98 10:50 Prep Date: 05/12/98 Prep Batch #: 8132112 Dilution Factor: 1	Work Order #: Date Received: Analysis Date: Method:	05/07/98 05/28/98	Matrix: WATER
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 0.050	UNITS ug/L
SURROGATE Tetrachloro-m-xylene	PERCENT RECOVERY 76	RECOVERY LIMITS (10 - 130)	

(10 - 116)

74

# Client Sample ID: FIKLD BLANK #9

### GC Semivolatiles

Lot-Sample #: A8E070151-011	Work Order #:	CH127101	Matrix WATER
Date Sampled: 05/06/98 10:50	Date Received:	05/07/98	
Prep Date: 05/13/98	Analysis Date:	05/22/98	
Prep Batch #: 8133104 Dilution Factor: 1	Method:	SW846 8082	
		REPORTING	
PARAMETER	RESULT	LIMIT	UNITS
Aroclor 1016	ND	1.0	ug/L
Aroclor 1221	ND	1.0	ug/L
Aroclor 1232	ND	1.0	ug/L
Aroclor 1242	ND	1.0	ug/L
	ND	1.0	ug/L
Aroclor 1248		1.0	ug/L
Aroclor 1254	ND		
Aroclor 1260	ND	1.0	ug/L

 SURROGATE
 PERCENT
 RECOVERY

 Tetrachloro-m-xylene
 82
 (10 - 130)

 Decachlorobiphenyl
 46
 (10 - 116)

# Client Sample ID: FIKLD BLANK #9

#### TOTAL Metals

Matrix....: WATER Lot-Sample #...: A8E070151-011

Date Sampled...: 05/06/98 10:50 Date Received..: 05/07/98

PREPARATION- WORK REPORTING PARAMETER RESULT LIMIT UNITS METHOD ANALYSIS DATE ORDER #

Prep Batch #...: 8132253

05/13-05/18/98 CH127103 7.0 ug/L SW846 6010A Cobalt

Dilution Factor: 1

# Client Sample ID: RFI-I (RES) SS-13

## GC Semivolatiles

Lot-Sample #: Date Sampled: Prep Date: Prep Batch #:	05/06/98 11:45 05/13/98	Work Order #: Date Received: Analysis Date:	02/01/30	Matrix: SOLID
Dilution Factor:	10	Method:	SW846 8082	

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260	ND ND ND ND ND ND ND	380 380 380 380 380 380 380	ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg
SURROGATE Tetrachloro-m-xylene Decachlorobiphenyl	PERCENT RECOVERY 97 DIL 180 DIL,*	RECOVERY LIMITS (8.0- 12: (0.0- 13:	

### NOTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

\* Moisture....: 13

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

Surrogate recovery is outside stated control limits.

# Client Sample ID: RFI-I (RES) SS-13

### TOTAL Metals

Matrix....: SOLID Lot-Sample #...: A8E070151-012

Date Sampled...: 05/06/98 11:45 Date Received..: 05/07/98

\* Moisture....: 13

PREPARATION-WORK REPORTING ANALYSIS DATE ORDER # METHOD

LIMIT UNITS PARAMETER RESULT

Prep Batch #...: 8135119

SW846 6010A 05/15-05/18/98 CH128102 5740 ug/kg 122000 Cobalt

Dilution Factor: 1

NOTE (S):

Results and reporting limits have been adjusted for dry weight.

## Client Sample ID: RFI-I (RES) SS-14

### GC Semivolatiles

Lot-Sample #: A8E070151-013	Work Order #: CH129103	Matrix: SOLID
Doc campae "		

Date Sampled...: 05/06/98 12:45 Date Received..: 05/07/98 Prep Date....: 05/14/98 Analysis Date..: 06/02/98

Prep Batch #...: 8134157

Dilution Factor: 20

% Moisture....: 11 Method.....: SW846 8082

PARAMETER	RESULT	LIMIT	UNITS
Aroclor 1016	ND	740	ug/kg
Aroclor 1221	ND	740	ug/kg
Aroclor 1232	ND	740	ug/kg
Aroclor 1242	ND	740	ug/kg
Aroclor 1248	ND	740	ug/kg
Aroclor 1254	ND	740	ug/kg
Aroclor 1260	ND	740	ug/kg
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	
Tetrachloro-m-xylene	99 DIL	(8.0- 129	
Decachlorobiphenyl	131 DIL	(0.0- 138	3)

#### NOTE (S)

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

## Client Sample ID: RFI-I (RES) SS-14

### TOTAL Metals

Matrix....: SOLID Lot-Sample #...: A8E070151-013

Date Sampled...: 05/06/98 12:45 Date Received..: 05/07/98

\* Moisture....: 11

PREPARATION-WORK REPORTING ANALYSIS DATE ORDER # METHOD LIMIT UNITS PARAMETER RESULT

Prep Batch #...: 8135119

SW846 6010A 05/15-05/18/98 CH129102 ug/kg 5630 Cobalt 140000

Dilution Factor: 1

NOTE (S):

Results and reporting limits have been adjusted for dry weight.

## Client Sample ID: RFI-I (RES) SS-17

### GC Semivolatiles

Lot-Sample #: Date Sampled: Prep Date: Prep Batch #:	05/06/98 13:45 05/13/98	Work Order #: Date Received: Analysis Date:	05/07/90	PACITA
Dilution Factor:	20	Method:	SW846 8082	
			REPORTING	

PARAMETER	RESULT	LIMIT	UNITS
Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260	ND ND ND ND ND ND	770 770 770 770 770 770 770	ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg
SURROGATE Tetrachloro-m-xylene Decachlorobiphenyl	PERCENT RECOVERY 129 DIL 250 DIL,*	RECOVERY LIMITS (8.0- 12 (0.0- 13	29)

#### TOTE (S)

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

## Client Sample ID: RFI-I (RES) SS-17

### TOTAL Metals

Matrix..... SOLID Lot-Sample #...: A8E070151-014

Date Sampled...: 05/06/98 13:45 Date Received..: 05/07/98

% Moisture....: 14

PREPARATION-REPORTING ANALYSIS DATE ORDER #

LIMIT UNITS METHOD PARAMETER RESULT

Prep Batch #...: 8135119

05/15-05/18/98 CH12A102 SW846 6010A 5800 ug/kg 200000 Cobalt

Dilution Factor: 1

NOTE (S):

Results and reporting limits have been adjusted for dry weight.

## Client Sample ID: RFI-I (RES) SS-18

#### GC Semivolatiles

Tot-Sample # A8E070151-015 Work	order #: CH12C103	Matrix: SOLID
---------------------------------	-------------------	---------------

Date Sampled...: 05/06/98 14:30 Date Received..: 05/07/98 Analysis Date..: 06/02/98 Prep Date....: 05/13/98

Prep Batch # ...: 8133101

Dilution Factor: 20

Method....: SW846 8082 \* Moisture....: 13

PARAMETER	RESULT	LIMIT	UNITS	
Aroclor 1016	ND	760	ug/kg	
Aroclor 1221	ND	760	ug/kg	
Aroclor 1232	ND	760	ug/kg	
Aroclor 1242	ND	760	ug/kg	
Aroclor 1248	ND	760	ug/kg	
Aroclor 1254	ND	760	ug/kg	
Aroclor 1260	ND	760	ug/kg	
	PERCENT	RECOVERY		
SURROGATE	RECOVERY	LIMITS	and the second	
Tetrachloro-m-xylene	196 DIL,*	(8.0- 12		
Decachlorobiphenyl	255 DIL,*	(0.0- 13	8)	

### NOTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

Client Sample ID: RFI-I (RES) SS-18

#### TOTAL Metals

Matrix....: SOLID Lot-Sample #...: A8E070151-015

Date Sampled...: 05/06/98 14:30 Date Received..: 05/07/98

\* Moisture....: 13

PREPARATION-WORK REPORTING ANALYSIS DATE ORDER # METHOD PARAMETER RESULT LIMIT UNITS

Prep Batch #...: 8135119

05/15-05/18/98 CH12C102 SW846 6010A ug/kg 157000 5750 Cobalt

Dilution Factor: 1

NOTE (S):

Results and reporting limits have been adjusted for dry weight.

## Client Sample ID: RFI-I (RES) SS-3

### GC Semivolatiles

Lot-Sample #: A8E070151-016 Date Sampled: 05/06/98 15:2 Prep Date: 05/12/98 Prep Batch #: 8132107	Work Order #: Date Received: Analysis Date:	05/07/98	Matrix SOLID
Dilution Factor: 20 % Moisture: 11	Method:	SW846 8081	A
PARAMETER Hexachlorobenzene	RESULT ND	REPORTING LIMIT 74	UNITS ug/kg
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS	
Tetrachloro-m-xylene	0.0 DIL,*	(8.0- 129)	

0.0 DIL

(0.0 - 138)

### NOTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Decachlorobiphenyl

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

## Client Sample ID: RFI-I (RES) SS-3

### GC Semivolatiles

Lot-Sample #: Date Sampled: Prep Date: Prep Batch #:	05/06/98 15:20 05/12/98	Work Order #: Date Received: Analysis Date:	03/01/30	Matrix	: SOLID
Dilution Factor:	20	Method:	SW846 8082		
		RESULT	REPORTING LIMIT	UNITS	
PARAMETER		ND	740	ug/kg	
Aroclor 1016		ND	740	ug/kg	
Aroclor 1221		ND	740	ug/kg	
Aroclor 1232		ND	740	ug/kg	
Aroclor 1242		ND	740	ug/kg	
Aroclor 1248		ND	740	ug/kg	
Aroclor 1254		ND	740	ug/kg	
Aroclor 1260		MD		-	
		PERCENT	RECOVERY		
		RECOVERY	LIMITS		
SURROGATE Tetrachloro-m-xy	lana	88 DIL	(8.0- 129)		
Terrachiolo-m-xy	TCTTC				

172 DIL,\*

(0.0 - 138)

### NOTE (S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Tetrachloro-m-xylene

Decachlorobiphenyl

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

<sup>\*</sup> Surrogate recovery is outside stated control limits.

QUALITY CONTROL SECTION

## QUALITY CONTROL ELEMENTS OF SW-846 METHODS

Quanterra® Incorporated conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

### **OC BATCH**

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. Quanterra requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

### LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. Failure to meet the established recovery guidelines requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). Failure of the RPDs to fall within the laboratory-generated acceptance windows requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the MS/MSD RPDs are within acceptance criteria, the batch is acceptable.

### METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except for the common laboratory contaminants indicated below.

Volatile (GC or GC/MS)	Semivolatile (GC/MS)	Metals
Methylene chloride Acetone 2-Butanone	Phthalate Esters	Copper Iron Zinc Lead*

<sup>\*</sup> for analyses run on TJA Trace ICP or GFAA only

## QUALITY CONTROL ELEMENTS OF SW-846 METHODS (continued)

METHOD BLANK (continued)

The listed volatile and semivolatile compounds may be present in concentrations up to 5 times the reporting limits. The listed metals may be present in concentrations up to 2 times the reporting limit or must be twenty fold less than the results of the environmental samples. Failure to meet these Method Blank criteria requires the repreparation and reanalysis of all samples in the QC batch.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. When these values fail to meet acceptance criteria, the data is reviewed to determine the cause. If, in the analyst's judgment, sample matrix effects are indicated, no corrective action is performed. Otherwise, the MS/MSD and the environmental sample used to prepare them are reprepared and reanalyzed.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch.

SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample are spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

The acceptance criteria do not apply to samples that are diluted. If the dilution is more than 5X, the recoveries will be reported as diluted out. All other surrogate recoveries will be reported. If the LCS, LCSD, or the Method Blank surrogates fail to meet recovery criteria (exception for dilutions), the entire batch of samples is reprepared and reanalyzed.

If the surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank and the associated sample(s) are ND, the batch is acceptable. If the surrogate recoveries are outside criteria for environmental or MS/MSD samples, the batch may be acceptable based on the analyst's judgment that sample matrix effects are indicated.

For the GC/MS BNA methods, the surrogate criteria is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide/PCB, PAH, TPH, and Herbicide methods, the surrogate criteria is that one of two surrogate compounds meet acceptance criteria.

### GC Semivolatiles

Client Lot #...: A8E070151 Work Order #...: CH3NN102 Matrix.....: WATER

LCS Lot-Sample#: A8E120000-112

Prep Date....: 05/12/98 Analysis Date..: 05/29/98

Prep Batch #...: 8132112

Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Lindane	76	(63 - 122)	SW846 8081A
Heptachlor	74	(56 - 125)	SW846 8081A
Aldrin	69	(60 - 117)	SW846 8081A
Dieldrin	83	(63 - 122)	SW846 8081A
	79	(48 - 129)	SW846 8081A
Endrin 4,4'-DDT	87	(55 - 128)	SW846 8081A
		PERCENT	RECOVERY
SURROGATE		RECOVERY	LIMITS
Tetrachloro-m-xylene		56	(10 - 130)
Decachlorobiphenyl		20	(10 - 116)

NOTE (S):

alculations are performed before rounding to avoid round-off errors in calculated results.

sold print denotes control parameters

### GC Semivolatiles

Client Lot #...: A8E070151 Work Order #...: CH3NF102 Matrix.....: SOLID

LCS Lot-Sample#: A8E120000-107

Prep Date....: 05/12/98 Analysis Date..: 05/30/98

Prep Batch #...: 8132107

Dilution Factor: 1

PARAMETER Lindane Heptachlor Aldrin Dieldrin Endrin 4,4'-DDT	PERCENT RECOVERY 59 58 49 62 66 74	RECOVERY LIMITS (52 - 108) (53 - 130) (43 - 116) (62 - 107) (64 - 127) (52 - 128)	METHOD SW846 8081A SW846 8081A SW846 8081A SW846 8081A SW846 8081A SW846 8081A
SURROGATE Tetrachloro-m-xylene Decachlorobiphenyl		PERCENT RECOVERY 68 64	RECOVERY LIMITS (8.0- 129) (0.0- 138)

NOTE (S):

alculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

### GC Semivolatiles

Matrix....: SOLID Work Order #...: CH3NG102 Client Lot # ...: A8E070151

LCS Lot-Sample#: A8E120000-108

Analysis Date..: 05/27/98 Prep Date....: 05/12/98

Prep Batch #...: 8132108

Dilution Factor: 2

PARAMETER	PERCENT	RECOVERY	METHOD
Aroclor 1016 Aroclor 1260	93 100	(60 - 133) (59 - 129)	SW846 8082 SW846 8082
SIDDOGATE		PERCENT	RECOVERY LIMITS

98

115

(8.0 - 129)

(0.0 - 138)

Tetrachloro-m-xylene Decachlorobiphenyl

SURROGATE

### GC Semivolatiles

Client Lot #...: A8E070151 Work Order #...: CH4JD102 Matrix.....: SOLID

LCS Lot-Sample#: A8E130000-101

Prep Date....: 05/13/98 Analysis Date..: 05/20/98

Prep Batch # ...: 8133101

Dilution Factor: 5

RECOVERY PERCENT METHOD LIMITS RECOVERY PARAMETER (60 - 133) SW846 8082 96 Aroclor 1016 SW846 8082 (59 - 129) 105 Aroclor 1260 RECOVERY PERCENT

 SURROGATE
 RECOVERY
 LIMITS

 Tetrachloro-m-xylene
 89
 (8.0- 129)

 Decachlorobiphenyl
 118
 (0.0- 138)

NOTE (S):

### GC Semivolatiles

Client Lot #...: A8E070151 Work Order #...: CH4JG102-LCS Matrix....: WATER

LCS Lot-Sample#: A8E130000-104 CH4JG103-LCSD

Prep Date....: 05/13/98 Analysis Date..: 05/22/98

Prep Batch #...: 8133104

Dilution Factor: 2

22226	PERCENT	RECOVERY	RPD LIMITS	METHOD							
PARAMETER Aroclor 1016	91	(66 - 111)	13/19 1.42/3	SW846 8082							
200101 1010	88	(66 - 111)	2.4 (0-23)	SW846 8082							
Aroclor 1260	93	(65 - 111)		SW846 8082							
	92	(65 - 111)	1.1 (0-23)	SW846 8082							
		PERCENT	RECOVERY								
SURROGATE	The state of the s	RECOVERY	LIMITS								
Tetrachloro-m-xylene		96	(10 - 130)								
100100112010 1.7		93	(10 - 130)								
Decachlorobiphenyl		92	(10 - 116)								
Decacification of the second		90	(10 - 116)								

NOTE (S):

### GC Semivolatiles

Client Lot #...: A8E070151 Work Order #...: CH5JF102 Matrix.....: SOLID

LCS Lot-Sample#: A8E140000-157

Prep Date....: 05/14/98 Analysis Date..: 05/29/98

Prep Batch #...: 8134157

Dilution Factor: 2

 PERCENT
 RECOVERY

 PARAMETER
 RECOVERY
 LIMITS
 METHOD

 Aroclor 1016
 95
 (60 - 133)
 SW846 8082

Aroclor 1016 Aroclor 1260 100 (59 - 129) SW846 8082

 SURROGATE
 RECOVERY
 LIMITS

 Tetrachloro-m-xylene
 98
 (8.0- 129)

 Decachlorobiphenyl
 106
 (0.0- 138)

NOTE (S):

### TOTAL Metals

Matrix....: WATER Client Lot # ...: A8E070151

> PREPARATION-PERCENT RECOVERY

LIMITS METHOD ANALYSIS DATE WORK ORDER # RECOVERY PARAMETER

LCS Lot-Sample#: A8E120000-253 Prep Batch #...: 8132253
Cobalt 96 (83 - 107) SW846 6010A 05/13-05/18/98 CH4EA103

Dilution Factor: 1

NOTE (S):

#### TOTAL Metals

Client Lot # ...: A8E070151

Matrix....: SOLID

PERCENT

RECOVERY

PREPARATION-

PARAMETER

RECOVERY LIMITS METHOD ANALYSIS DATE WORK ORDER #

LCS Lot-Sample#: A8E150000-119 Prep Batch #...: 8135119
Cobalt 93 (80 - 104) SW846 6010A 05/15-05/18/98 CH6F4102

Dilution Factor: 1

NOTE (S):

#### GC Semivolatiles

Client Lot #...: A8E070151 Work Order #...: CH3NN101 Matrix..... WATER

MB Lot-Sample #: A8E120000-112
Prep Date....: 05/12/98

Analysis Date..: 05/29/98 Prep Batch #...: 8132112

58

Dilution Factor: 1

REPORTING METHOD UNITS RESULT LIMIT PARAMETER SW846 8081A 0.050 ug/L ND Hexachlorobenzene RECOVERY PERCENT LIMITS RECOVERY SURROGATE (10 - 130)52 Tetrachloro-m-xylene

(10 - 116)

NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Decachlorobiphenyl

### GC Semivolatiles

Client Lot #...: A8E070151

Work Order #...: CH3NF101

Matrix....: SOLID

MB Lot-Sample #: A8E120000-107

Prep Date....: 05/12/98

Analysis Date..: 06/03/98

Prep Batch #...: 8132107

Dilution Factor: 1

REPORTING

PARAMETER RESULT LIMIT UNITS METHOD
Hexachlorobenzene ND 3.3 ug/kg SW846 8081A

SURROGATE
Tetrachloro-m-xylene
Decachlorobiphenyl

PERCENT RECOVERY

RECOVERY
98 (8.0- 129)
188 \* (0.0- 138)

NOTE (S):

<sup>\*</sup> Surrogate recovery is outside stated control limits.

### GC Semivolatiles

Client Lot #...: A8E070151

Work Order #...: CH3NG101

Matrix....: SOLID

MB Lot-Sample #: A8E120000-108

Prep Date....: 05/12/98

Analysis Date..: 05/27/98

Prep Batch #...: 8132108

Dilution Factor: 1

	RESULT	LIMIT	UNITS	METHOD
PARAMETER		33	ug/kg	SW846 8082
Aroclor 1016	ND	33	ug/kg	SW846 8082
Aroclor 1221	ND	Service Control of the Control of th		SW846 8082
Aroclor 1232	ND	33	ug/kg	
Aroclor 1242	ND	33	ug/kg	SW846 8082
	ND	33	ug/kg	SW846 8082
Aroclor 1248	ND	33	ug/kg	SW846 8082
Aroclor 1254		33	ug/kg	SW846 8082
Aroclor 1260	ND	33	-5,5	
	PERCENT	RECOVER	Y	
	RECOVERY	LIMITS		
SURROGATE		(8.0- 1	29)	
Tetrachloro-m-xylene	82	(0.0- 1		
Decachlorobiphenyl	93	(0.0- 1	.30/	

TE (S):

### GC Semivolatiles

Client Lot #...: A8E070151

Work Order #...: CH4JD101

Matrix....: SOLID

MB Lot-Sample #: A8E130000-101

Prep Date....: 05/13/98

REPORTING

Analysis Date..: 05/20/98

Prep Batch #...: 8133101

Dilution Factor: 1

r: 1

ррстп.т	LIMIT	UNITS	METHOD
		ug/kg	SW846 8082
			SW846 8082
ND			SW846 8082
ND			SW846 8082
ND	33		
ND	33	ug/kg	SW846 8082
	33	ug/kg	SW846 8082
	33	ug/kg	SW846 8082
ND	33	3, 3	
PERCENT	RECOVER	Y	
	LIMITS		
		29)	
93	(0.0- 1	.301	
	3320	ND 33 PERCENT RECOVER RECOVERY LIMITS 85 (8.0-1	ND 33 ug/kg LIMITS (8.0- 129)

TE (S):

### GC Semivolatiles

Client Lot #...: A8E070151

Work Order #...: CH4JG101

Matrix..... WATER

MB Lot-Sample #: A8E130000-104

Prep Date....: 05/13/98

Analysis Date..: 05/22/98

Prep Batch #...: 8133104

Dilution Factor: 1

REPORTING

	RESULT	LIMIT	UNITS	METHOD
PARAMETER Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242	ND ND ND	1.0 1.0 1.0	ug/L ug/L ug/L ug/L ug/L	SW846 8082 SW846 8082 SW846 8082 SW846 8082 SW846 8082
Aroclor 1248 Aroclor 1254 Aroclor 1260	ND ·	1.0 1.0 1.0	ug/L ug/L	SW846 8082 SW846 8082
SURROGATE Tetrachloro-m-xylene Decachlorobiphenyl	PERCENT RECOVERY 82 79	LIMITS (10 - 1 (10 - 1	30)	

OTE (S):

### GC Semivolatiles

Client Lot #...: A8E070151

Work Order #...: CH5JF101

Matrix....: SOLID

MB Lot-Sample #: A8E140000-157

Prep Date....: 05/14/98

Analysis Date..: 05/28/98

Prep Batch #...: 8134157

Dilution Factor: 1

	RESULT	LIMIT	UNITS	METHOD
PARAMETER		33	ug/kg	SW846 8082
Aroclor 1016	ND		ug/kg	SW846 8082
Aroclor 1221	ND	33		SW846 8082
Aroclor 1232	ND	33	ug/kg	
Aroclor 1242	ND	33	ug/kg	SW846 8082
	ND	33	ug/kg	SW846 8082
Aroclor 1248	5.30	33	ug/kg	SW846 8082
Aroclor 1254	ND		ug/kg	SW846 8082
Aroclor 1260	ND	33	ug/kg	511020 0002
	PERCENT	RECOVER	Y	
	RECOVERY	LIMITS		
SURROGATE	_	(8.0- 1	29)	
Tetrachloro-m-xylene	90			
Decachlorobiphenyl	100	(0.0- 1	38)	

TE(S):

alculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

### TOTAL Metals

Matrix..... WATER Client Lot # ...: A8E070151

PREPARATION- WORK REPORTING ANALYSIS DATE ORDER #

PARAMETER RESULT LIMIT UNITS METHOD

MB Lot-Sample #: A8E120000-253 Prep Batch #...: 8132253

7.0 ug/L SW846 6010A 05/13-05/18/98 CH4EA101 Cobalt ND

Dilution Factor: 1

#### TOTAL Metals

Client Lot # ...: A8E070151

Matrix....: SOLID

REPORTING

PREPARATION- WORK

PARAMETER RESULT LIMIT UNITS METHOD

ANALYSIS DATE ORDER #

MB Lot-Sample #: A8E150000-119 Prep Batch #...: 8135119

ND

.5000

ug/kg

SW846 6010A 05/15-05/18/98 CH6F4101

Dilution Factor: 1

NOTE (S):

#### GC Semivolatiles

Client Lot #...: A8E070151 Work Order #...: CH10J102-MS Matrix..... WATER

MS Lot-Sample #: A8E070151-001 CH10J103-MSD

Date Sampled...: 05/06/98 10:22 Date Received..: 05/07/98 Prep Date....: 05/12/98 Analysis Date..: 05/29/98

Prep Batch #...: 8132112

Dilution Factor: 1

	PERCENT	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
PARAMETER		(48 - 135)	-		SW846 8081A
Lindane	70	(48 - 135)	5.5	(0-51)	SW846 8081A
	66	(56 - 158)	3.5	(0 0-7	SW846 8081A
Heptachlor	61	(56 - 158)	2.0	(0-36)	SW846 8081A
	62	(54 - 120)	2.0	(0 50)	SW846 8081A
Aldrin	62	(54 - 120)	4.9	(0-40)	SW846 8081A
	59	(54 - 143)	2.5	(0 10)	SW846 8081A
Dieldrin	71	(54 - 143)	4.8	(0-32)	SW846 8081A
	74	(64 - 142)	4.0	(0 52)	SW846 8081A
Endrin	73		3.1	(0-39)	SW846 8081A
	76	(64 - 142)	3.1	(0 33)	SW846 8081A
4,4'-DDT	71	(48 - 154) (48 - 154)	5.5	(0-47)	SW846 8081A
	75	(48 - 154)	3.3	(0 4//	
		PERCENT		RECOVERY	
GIRROGATE		RECOVERY		LIMITS	
SURROGATE Tetrachloro-m-xylene		56		(10 - 13	30)
Tetrachioro-m-xylene		53		(10 - 13	30)
Description of the series		58		(10 - 11	
Decachlorobiphenyl		62		(10 - 11	16)

NOTE (S) :

#### TOTAL Metals

Matrix....: WATER Client Lot # ...: A8E070151

Date Sampled...: 05/05/98 08:45 Date Received..: 05/06/98

PREPARATION- WORK PERCENT RECOVERY RPD ANALYSIS DATE ORDER # PARAMETER RECOVERY LIMITS RPD LIMITS METHOD

MS Lot-Sample #: A8E060157-012 Prep Batch #...: 8132253

05/13-05/18/98 CGXXT106 SW846 6010A (80 - 120) 97 Cobalt

(80 - 120) 0.96 (0-20) SW846 6010A 05/13-05/18/98 CGXXT107 96

Dilution Factor: 1

NOTE (S):

#### TOTAL Metals

Client Lot #...: A8E070151 Matrix....: SOLID

Date Sampled...: 05/05/98 13:55 Date Received..: 05/06/98

PERCENT RECOVERY RPD PREPARATION- WORK

PARAMETER RECOVERY LIMITS RPD LIMITS METHOD ANALYSIS DATE ORDER #

MS Lot-Sample #: A8E060157-018 Prep Batch #...: 8135119

Cobalt 109 (80 - 120) SW846 6010A 05/15-05/18/98 CH00G104 48 N,\* (80 - 120) 36 (0-20) SW846 6010A 05/15-05/18/98 CH00G105

Dilution Factor: 1

#### NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

- N Spiked analyte recovery is outside stated control limits.
- \* Relative percent difference (RPD) is outside stated control limits.

#### TOTAL Metals

Client Lot #...: A8E070151 Matrix....: SOLID

Date Sampled...: 05/04/98 19:20 Date Received..: 05/06/98

PERCENT RECOVERY RPD PREPARATION- WORK

PARAMETER RECOVERY LIMITS RPD LIMITS METHOD ANALYSIS DATE ORDER #

MS Lot-Sample #: A8E060157-028 Prep Batch #...: 8135119

Cobalt 92 (80 - 120) SW846 6010A 05/15-05/18/98 CH02L107 95 (80 - 120) 3.1 (0-20) SW846 6010A 05/15-05/18/98 CH02L108

Dilution Factor: 1

### NOTE (S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

Chain of tody Record



Project Number/Name  Ord by A RFI  Contract/Purchase Order/Quote Number  Sample I.D. Number and Description  Diagrams	144		Site Coptact  A Ro  Carrier/Waybill Nun	778 - 53 Snyd	umber	40	Lat	North Canton, OH /	PORON HORON	THABLE CA GOIT B		A	_ of _	is	
Address 935 Bush Avz.  City St. Paul State Zip Coo. MN SS  Project Number/Name Contract/Purchase Order/Quote Number  Sample I.D. Number and Description  Da	144-		Site Coptact  ARol  Carrier/Waybill Nun	(Area Code)/Fax No.	amber 3 7 7	40	Lat	North Canton, OH 1	20 A	ENABLE CA 9017		A	nalys	Is	
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		Time	Sample Type	Cont Volume	lainers Type	No.	Preservative	Condition on Receipt/Comments	ET V	TOTAL	Ц				1
TFI-I(ILES) MU9-90, SIL	191	10:22	LISTIL	1 Liter 250ml	PLASTIC	7	NaoH	Rush (results w/ Ledays)	X v	X	+			-	#
RFT-I (156) MU9-90 (M5/MD*2) 5/1	191-	10:21		250 ml	Aver Putne Arby	2 1 2	Nonr Nonr		X	X					
¥ , , , , ,	6/93 6/91	11:57		750ml	PLASTIC	1 2	Narolt	Rush (results His ledays)	X	¥					
, ,	./93	11107		750ml 1 Liter	Phone	1	100H	Rush (results whi ledays)	X	X		+	-		
4	91	14:01		250 ml 1 Liter 250 ml	ALL PURTE	2	None None Na Olt	Rush (regults wie asker	X	X			-		
RFT - 7 (RES) MU4-90 SIL	93	15:40		1 Liter 250 ml	PLASTIC		No OH	Hold	X	X		-	_	+	#
FIELD BLANK 5/4	4 98	16:04 NA	LIATER	250ml	PLASTIC	1	NONE	TEMP. Bt 3.5°C upon shipm	17	X		1			
Special Instructions Call Cathy Larson 412-55 Possible Hazard Identification			or CAro	Sample Disp	der 4/	Q	usstions		(4)	oo ma	y be i	ssess	ed if s	ample	os are
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3. Relinquished By			Date	Time	3. Rece	lved By	Pos	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			Date 5- 7	7-9	8	Time	000

DISTRIBUTION: WHITE - Stavs with the Sample: CANARY - Returned to Client with Report; PINK - Field Copy

# Chain of Stody Record

Custody 0 Semls: 042656 + 042691



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Special Instructions  Call Cithy Larson	617.	CCI	-2474	OR	C9/0	1.	Snyder	612-778-5388	?	·	-/	Qu	es	tio	n 5	
Possible Hazaud Identification	872	341		Cample Dien	ocal				14	A faa	mau	y ha a	256226	sed if sa	moles	are
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DISTRIBUTION: WHITE - Stays with the Sample: O					3			prior to	5	4:	PI	40.	, t	~	141	02

## CORDOVA RFI

## MAY 1998 ANALYTICAL REPORT

LOT #: A8F180181



Quanterra Incorporated 4101 Shuffel Drive, NW North Canton, Ohio 44720

> 330 497-9396 Telephone 330 497-0772 Fax

## ANALYTICAL REPORT

CORDOVA RFI MAY 1998

Lot #: A8F180181

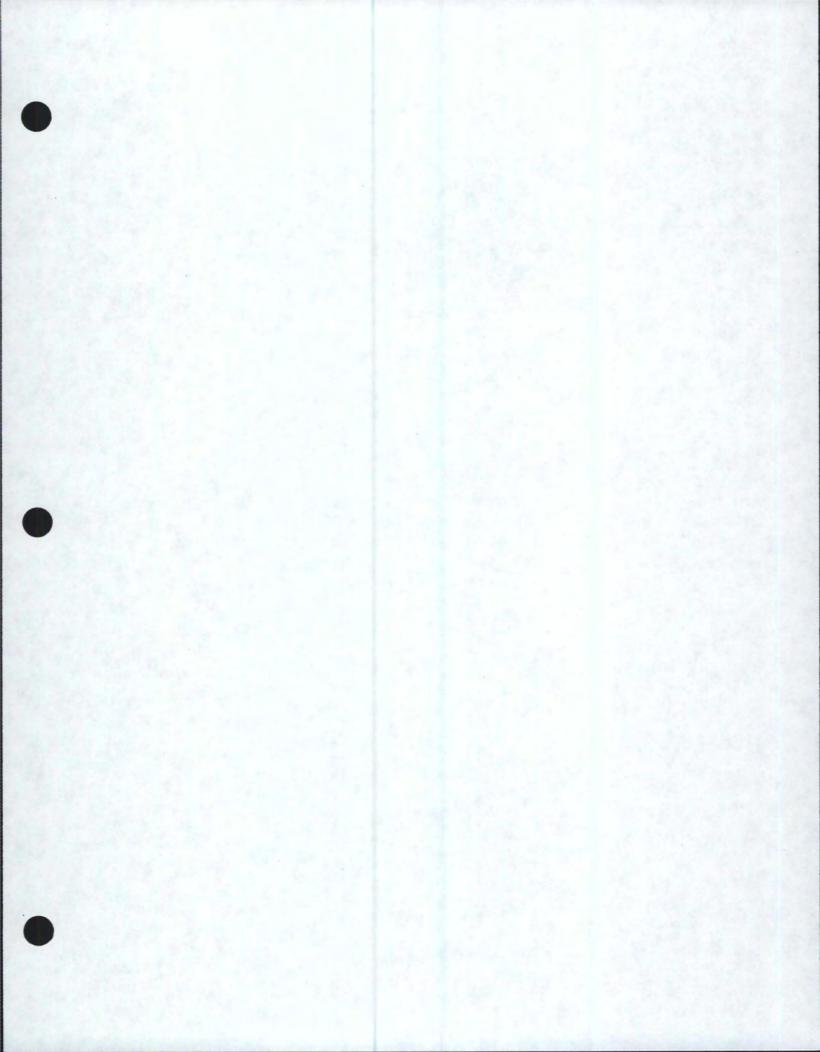
Carol Snyder

3M Company

QUANTERRA INCORPORATED

Jeffrey d. Smith Project Manager

July 1, 1998



### CASE NARRATIVE

The following report contains the analytical results for six water samples submitted to Quanterra-North Canton by 3M Company from the Cordova RFI May 1998 Site. The samples were originally received May 6, 1998 according to documented sample acceptance procedures, and were analyzed for a variety of parameters. On June 18, 1998, the client requested analyses for total and dissolved Cobalt. Those results can be found in this report.

Quanterra-North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided by facsimile transmission to Carol Snyder of the 3M Company and to Pam Hoover of AquaEter June 2 and 5, 1998.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

The coolers were received at the laboratory at temperatures of 1.2, 0.6, 1.1, 0.5, 0.5 and 0.2° C.

## SUPPLEMENTAL QC INFORMATION

#### **METALS**

There is the possibility of false positive results when reporting down to the Method Detection Limit (MDL). The acceptance criteria for ICB, CCB, and Method Blank is ±the RL.

# ANALYTICAL METHODS SUMMARY

#### A8F180181

PARAMETER ANALYTICAL METHOD

Dissolved ICP Metals Trace Inductively Coupled Plasma (ICP) Metals SW846 6010A SW846 6010A

#### References:

SW846

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

#### A8F180181

WO # S	AMPLE#	CLIENT SAMPLE ID	DATE	TIME
CJ52Q CJ52W CJ52X CJ530 CJ531 CJ532	001 002 003 004 005 006	RFI-I (RES) MW5-90 (MS/MSD 1) RFI-I (RES) MW6-90 RFI-I (RES) MW1-94 RFI-I (RES) MW2-94 RFI-I (RES) MW7-94 FIELD DUPLICATE #1	05/04/98 05/05/98 05/05/98 05/05/98 05/05/98	3 09:17 3 12:14 3 13:56 3 14:55

#### NOTE (S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# Client Sample ID: RFI-I (RES) MW5-90 (MS/MSD 1)

#### DISSOLVED Metals

Matrix....: WATER Lot-Sample #...: A8F180181-001

Date Sampled...: 05/04/98 18:39 Date Received..: 05/06/98

Cobalt ND

PREPARATION- WORK REPORTING ANALYSIS DATE ORDER # PARAMETER RESULT LIMIT UNITS METHOD Prep Batch #...: 8170195 7.0 ug/L SW846 6010A 06/19-06/22/98 CJ52Q104

# Client Sample ID: RFI-I (RES) MW5-90 (MS/MSD 1)

#### TOTAL Metals

Matrix....: WATER Lot-Sample #...: A8F180181-001

Date Sampled...: 05/04/98 18:39 Date Received..: 05/06/98

PREPARATION- WORK REPORTING LIMIT UNITS METHOD ANALYSIS DATE ORDER # PARAMETER RESULT

Prep Batch #...: 8170195

SW846 6010A 06/19-06/22/98 CJ52Q101 7.0 ug/L Cobalt

# Client Sample ID: RFI-I (RES) MW6-90

#### DISSOLVED Metals

Matrix....: WATER Lot-Sample #...: A8F180181-002

Date Sampled...: 05/05/98 09:17 Date Received..: 05/06/98

PREPARATION- WORK REPORTING ANALYSIS DATE ORDER # METHOD LIMIT UNITS PARAMETER RESULT

Prep Batch #...: 8170195

06/19-06/22/98 CJ52W102 SW846 6010A 7.0 ug/L ND Cobalt

Client Sample ID: RFI-I (RES) MW6-90

#### TOTAL Metals

Matrix....: WATER Lot-Sample #...: A8F180181-002

Date Sampled...: 05/05/98 09:17 Date Received..: 05/06/98

PREPARATION-WORK REPORTING ANALYSIS DATE ORDER # PARAMETER RESULT LIMIT UNITS METHOD

Prep Batch #...: 8170195

7.0 ug/L SW846 6010A 06/19-06/23/98 CJ52W101 ND Cobalt

# Client Sample ID: RFI-I (RES) MW1-94

#### DISSOLVED Metals

Lot-Sample # Date Sampled	: A8F180181 : 05/05/98	-003 12:14 Date R	eceived	: 05/06/98	Matrix:	WATER
PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #

Prep Batch #...: 8170195

ND 06/19-06/22/98 CJ52X102 SW846 6010A 7.0 ug/L Cobalt

# Client Sample ID: RFI-I (RES) MW1-94

#### TOTAL Metals

Matrix..... WATER Lot-Sample #...: A8F180181-003

Date Sampled...: 05/05/98 12:14 Date Received..: 05/06/98

Cobalt

PREPARATION-WORK REPORTING ANALYSIS DATE ORDER # PARAMETER RESULT LIMIT UNITS METHOD Prep Batch #...: 8170195 06/19-06/22/98 CJ52X101 SW846 6010A 7.0 ug/L ND

# Client Sample ID: RFI-I (RES) MW2-94

#### DISSOLVED Metals

Tot-Sample #: A8F180181	1-004 Matr	ix:	WATER

Date Sampled...: 05/05/98 13:56 Date Received..: 05/06/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #.	ND 8170195	7.0	ug/L	SW846 6010A	06/19-06/22/98	CJ530102

# Client Sample ID: RFI-I (RES) MW2-94

#### TOTAL Metals

Matrix..... WATER Lot-Sample #...: A8F180181-004

Date Sampled...: 05/05/98 13:56 Date Received..: 05/06/98

PREPARATION- WORK REPORTING LIMIT UNITS METHOD ANALYSIS DATE ORDER # PARAMETER RESULT

Prep Batch #...: 8170195

7.0 ug/L SW846 6010A 06/19-06/22/98 CJ530101 Cobalt

## Client Sample ID: RFI-I (RES) MW7-94

#### DISSOLVED Metals

Lot-Sample #...: A8F180181-005

Date Sampled...: 05/05/98 14:55 Date Received..: 05/06/98

REPORTING PREPARATION- WORK

PARAMETER RESULT LIMIT UNITS METHOD ANALYSIS DATE ORDER #

Prep Batch #...: 8170195

Cobalt ND 7.0 ug/L SW846 6010A 06/19-06/22/98 CJ531102

### Client Sample ID: RFI-I (RES) MW7-94

#### TOTAL Metals

Matrix....: WATER Lot-Sample #...: A8F180181-005

Date Sampled...: 05/05/98 14:55 Date Received..: 05/06/98

PREPARATION- WORK REPORTING PARAMETER RESULT LIMIT UNITS METHOD ANALYSIS DATE ORDER #

Prep Batch #...: 8170195

7.0 ug/L SW846 6010A 06/19-06/22/98 CJ531101 Cobalt ND

### Client Sample ID: FIKLD DUPLICATE #1

#### DISSOLVED Metals

Lot-Sample #...: A8F180181-006 Matrix....: WATER

Date Sampled...: 05/05/98 18:39 Date Received..: 05/06/98

PARAMETER RESULT LIMIT UNITS METHOD PREPARATION- WORK

ORDER #

Prep Batch #...: 8170195

Cobalt ND 7.0 ug/L SW846 6010A 06/19-06/22/98 CJ532102

# Client Sample ID: FIELD DUPLICATE #1

#### TOTAL Metals

Matrix....: WATER Lot-Sample #...: A8F180181-006

Date Sampled...: 05/05/98 18:39 Date Received..: 05/06/98

PREPARATION- WORK REPORTING ANALYSIS DATE ORDER # LIMIT UNITS METHOD PARAMETER RESULT

Prep Batch #...: 8170195

06/19-06/22/98 CJ532101 SW846 6010A 7.0 ug/L ND Cobalt

#### MATRIX SPIKE SAMPLE DATA REPORT

#### DISSOLVED Metals

Client Lot #...: A8F180181 Matrix....: WATER

Date Sampled...: 05/04/98 18:39 Date Received..: 05/06/98

PREPARATION-WORK SAMPLE SPIKE MEASURED PERCNT ANALYSIS DATE ORDER # RECVRY RPD METHOD PARAMETER AMOUNT AMT AMOUNT UNITS MS Lot-Sample #: A8F180181-001 Prep Batch #...: 8170195 Cobalt SW846 6010A 06/19-06/22/98 CJ52Q105 99 ND 500 495 ug/L 96 3.1 SW846 6010A 06/19-06/22/98 CJ52Q106 500 480 ug/L ND

Dilution Factor: 1

NOTE (S):

### MATRIX SPIKE SAMPLE EVALUATION REPORT

### DISSOLVED Metals

Client Lot #...: A8F180181 Matrix....: WATER

Date Sampled...: 05/04/98 18:39 Date Received..: 05/06/98

PERCENT RECOVERY RPD PREPARATION- WORK

PARAMETER RECOVERY LIMITS RPD LIMITS METHOD ANALYSIS DATE ORDER #

MS Lot-Sample #: A8F180181-001 Prep Batch #...: 8170195

Cobalt 99 (80 - 120) SW846 6010A 06/19-06/22/98 CJ52Q105 96 (80 - 120) 3.1 (0-20) SW846 6010A 06/19-06/22/98 CJ52Q106

Dilution Factor: 1

NOTE (S):

#### MATRIX SPIKE SAMPLE DATA REPORT

#### TOTAL Metals

Client Lot #...: A8F180181 Matrix....: WATER

Date Sampled...: 05/04/98 18:39 Date Received..: 05/06/98

PREPARATION-WORK PERCNT SAMPLE SPIKE MEASURED ANALYSIS DATE ORDER # RECVRY RPD METHOD PARAMETER AMOUNT AMT AMOUNT UNITS MS Lot-Sample #: A8F180181-001 Prep Batch #...: 8170195 Cobalt SW846 6010A 06/19-06/22/98 CJ52Q102 500 97 ND 489 ug/L 1.6 SW846 6010A 06/19-06/22/98 CJ52Q103 96 ND 500 482 ug/L

Dilution Factor: 1

NOTE (S):

# MATRIX SPIKE SAMPLE EVALUATION REPORT

### TOTAL Metals

Matrix..... WATER Client Lot # ...: A8F180181

Date Sampled...: 05/04/98 18:39 Date Received..: 05/06/98

PREPARATION-WORK PERCENT RECOVERY RPD ANALYSIS DATE ORDER #

PARAMETER RECOVERY LIMITS RPD LIMITS METHOD

MS Lot-Sample #: A8F180181-001 Prep Batch #...: 8170195

06/19-06/22/98 CJ52Q102 (80 - 120) SW846 6010A 97 Cobalt 06/19-06/22/98 CJ52Q103

(80 - 120) 1.6 (0-20) SW846 6010A 96

Dilution Factor: 1

NOTE (S):